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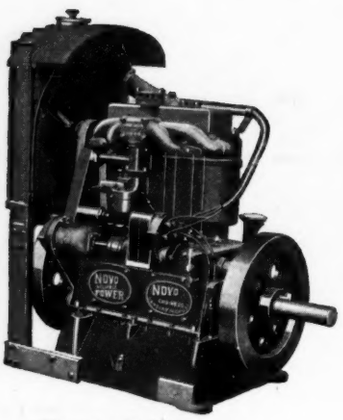

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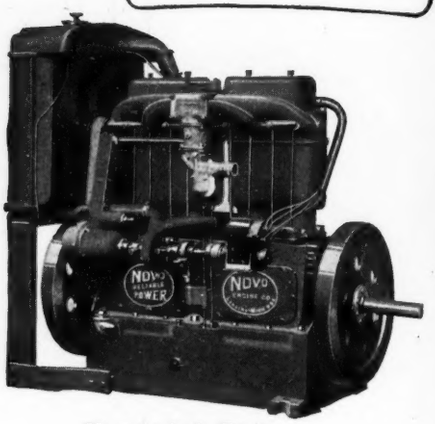

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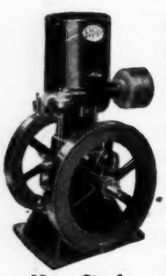

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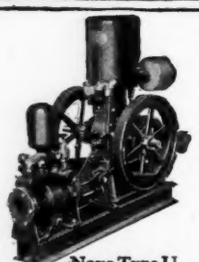

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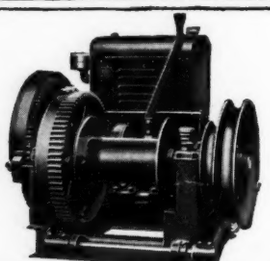

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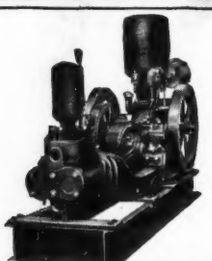

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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

Volume 23 NEW YORK, MARCH 29, 1923 Number 13

Another Coal Crisis Passed

A NEW coal year is about to open, and with the passing of the old goes the "coal crisis" of 1922-23. In regard to bituminous coal this crisis has been a tame affair compared with some others of the recent past. Hard-coal shortage has been real, however, for production in the coal year approximated but 54,000,000 net tons—less by some 35,000,000 net tons than the mark of 89,000,000 tons in the previous year—and the demand for and consumption of hard coal is fixed largely by the more or less rigid household requirements of half of the people of this country. It was a case of 60-per cent production and therefore of 60-per cent supply. Those who would keep warm perforce must have taken substitutes to make up the 40-per cent deficit. Much criticism and complaint was lodged with the hard-coal industry, which is to say with the whole coal industry, on this account. People are averse to change and especially a forced change. Nor do they always seek and find the real cause of some of their difficulties, as for instance the relation of the strike of hard-coal miners last year to their coal shortage of this past winter.

An evidence of the coal crisis was the springing up of the state fuel administrations, and just so the closing of their offices is evidence of the passing of the trouble. After April there hardly will be a single official to look after the coal troubles of the people, for there will be no coal troubles. But there is danger of a multiplicity of coal investigations and commissions. Legislatures in the Eastern states are deluged with bills of that sort. Efforts are being made locally to have such measures held in abeyance pending the outcome of the U. S. Coal Commission's findings. It will be noted that these aftermaths of the coal shortage are confined to the hard-coal burning territory.

Altogether, with no one wanting coal that he can't get day before yesterday and with Congress home until December, it appears that the summer will be quiet, with nothing for the coal men to do but fill out questionnaires for the Coal Commission.

Come and Hear George and Henry

NO more fortunate subject than that of the solution of the coal problem by "economic rather than legislative means" could have been selected for the national resources group of the Chamber of Commerce of the United States meeting in New York in May. We are told that two speakers—names not announced—will cover the subject, the first reviewing the work of the U. S. Coal Commission and the second presenting an analysis of the coal-mine labor situation and its effect on the cost of coal. Having put this over, there will be presented THE suggestion for "seeking an economic solution." The announcement of these plans is so cleverly done that everyone is on the *qui vive*. Rumors have it that George Cushing is to take on the first part of the program, giving a complete inside view of what the Coal Commission has been doing. It also is pretty generally conceded that Henry Ford will take on the second skit, dealing mainly with the labor situation and the cost of industrial coal.

Just who is framing the economic solution for presentation to an anxious world, NO word (the emphasis is Mr. Brooking's) is vouchsafed. Guesses are divided between Joe Frelinghuysen, Bob LaFollette, Jim Reed and John Lewis, with odds on the first named as the one who now has the most free time on his hands.

It also is reported that seats in the front of the house have been reserved for the U. S. Coal Commission and its staff, but the latest reports are that the commissioners will stay in Washington on the important job of digging up facts about coal.

The National Chamber is extending a hearty welcome to all coal men, whether they have or have not sent their questionnaires to Washington. Engraved invitations are to be sent to those who since last spring, have put themselves out of the way of going in June to Atlantic City, where the National Coal Association holds forth in annual convention this year.

Guilty or Not Guilty?

MANY acrobatics of publicity have been performed in the past by the United Mine Workers of America. Now that the official publicist of the miners' union organization has declared he never condoned the bloody acts of violence against the crimes of non-unionism and the right to work committed at Herrin, Cliftonville and Willis Branch, it would be interesting indeed to witness the union at the task of convincing the American public that it, as well as its press agent, believes in law and order.

Now that the National Coal Association, in a published statement, charges the union with condoning these horrors, the time certainly is propitious for the union to clear itself of all these "calumnies" that have been cast upon it. It would do the cause of labor unionism in the United States a great deal of good if an explanation were advanced just now to show why organized union defence has been provided for every man—whether a member of the union or not—charged with murder and inciting to murder at Herrin. There must be some laudable purpose behind such a stanch defence put up without question by the United Mine Workers. There must be some legitimate reason why union officials told the hardware-store keepers in the neighborhood of Herrin to "give the boys the guns. We'll see that you get your money," or words to that effect, as has been testified under oath. There must be some reason why the United Mine Workers made every effort to prevent prosecution at Herrin, even to a drive against the special appropriation by the Illinois Legislature for the carrying on of the case

against scores of men indicted for murder last winter.

Above all, there must be some good reason why the union has never exercised its righteous power in the punishment of any union man guilty of various non-union murders.

In a large section of the public mind the United Mine Workers stand convicted of condoning murder and of striving to shackle the law-enforcement machinery of this country where that machinery was crushing down on members of the union. And this conviction in the public mind has held for months. There has been no official defence offered. Has this silence been maintained merely pending a formal charge of some sort? The charge has now been made in the court of public opinion by the National Coal Association. What is the plea of the defendant—guilty or not guilty?

Consolidation and Clinchfield

ANNUAL reports of two coal companies were published last week. They are interesting principally because of the contrast offered in the amount and kind of information conveyed to the shareholders for whose benefit they presumably were written.

The annual report of the Consolidation Coal Co. for the year 1922 is a statistical summary of the financial operations and position of the company—the history of the year as seen through the eyes of the auditors. The president, C. W. Watson, who signs the report, does not offer even the usual remarks as to whether or not, and why, the year had been a successful one for the company. Save for a fine-print footnote attached to one of the tables following the signed report, there is no reference to the coal strike. Production, it appears, was the lowest since 1901, or in twenty-one years.

Whether the year's operations were profitable must be inferred from the financial data presented. Earnings from operations are recorded as $22,464,911.76; operating expenses, insurance, royalties, taxes exclusive of federal income tax, depreciation, and depletion at cost as $19,365,303.80, and net earnings from operations as $3,099,607.96. Against these figures appears a production "mined by the company" of 5,694,256 net tons, from which it can be calculated that realization averaged $3.94, cost $3.40 and net income (for dividends and interest) 54c. per net ton. Adding to net income from operations, profits from other activities of the company and deducting interest, it appears that net earnings before deducting federal income tax were $2,733,445.66, or 48c. per ton, or about 45c. per net ton over and above all outgo, including federal taxes.

These and other calculations may be made from the financial data presented, but there is nothing to tell the stockholders what the management thinks of 1922, the strike, car shortage or prices. It is disclosed that certain moneys were used in the acquisition of the Rivesville and Stafford mines of the Monongahela Power & Railway Co., the minority stock interest of the North Western Fuel Co., and the properties of the Carter Coal Co. Nothing is vouchsafed the shareholder, however, as to the significance of these purchases. The report is a cold-blooded financial statement wherein accountants auditing the books chronicle the stewardship of dollars and cents. The president does not even "take pleasure in expressing appreciation to the officers and employees for loyal and efficient service," to quote Judge Gary in his recent report to the stockholders of the Steel Corporation.

Stockholders of the Clinchfield Coal Corporation are differently informed with respect to the operations of their company. The president, C. E. Bockus, in his report for 1922 briefly but clearly and interestingly sets forth the chronicle of 1922. His report is mainly text, with views of the new camp of the corporation at Clinchco, and a diagram showing monthly variations in output, costs and sales realization. Causes of variation in production are discussed, the effects of the strike in the union fields—the Clinchfield is a non-union operation and "no time whatever was lost from any troubles with employees"—on rate of production and on costs are described. Distribution, treatment of contract customers, wages, average costs and prices are all covered. The impression on reading this report is that an effort has been made to tell the whole story and that if anything has been overlooked, the information may be had on application.

Mr. Bockus evidently appreciates the value of presenting information in the three ways—namely, by text, diagram or picture and statistical table—certain that one method at least will appeal to every reader. Incidentally Clinchfield averaged net earnings of 38c. per net ton before deduction of interest, dividends and federal income taxes, as against 54c. for the Consolidation.

Flotation in an Oil Foam

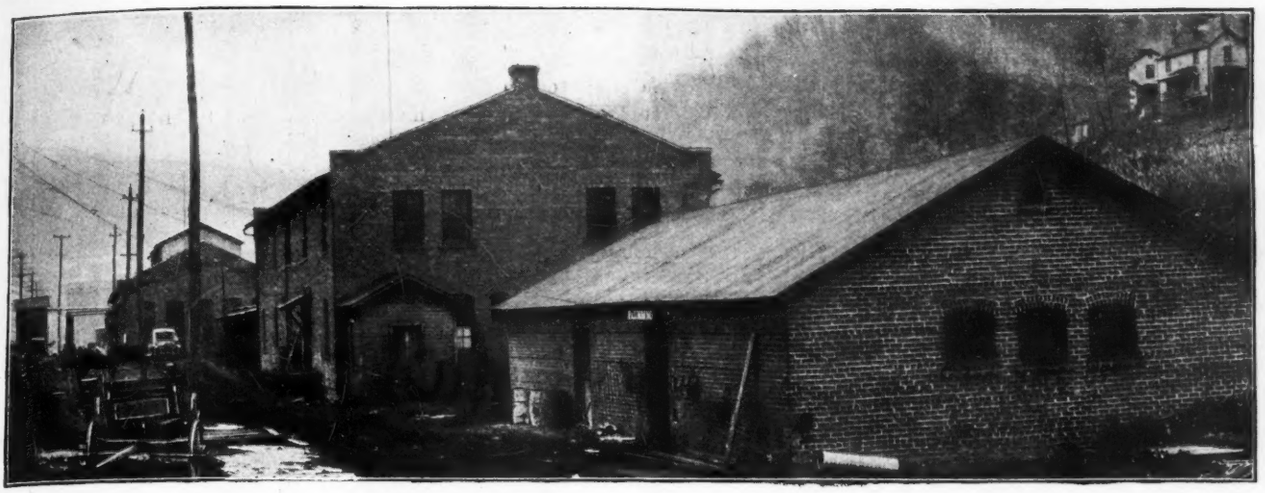
WHEN particles become small their surfaces are unduly large compared with their weight and in consequence their relations to any surrounding medium become of more importance than their specific gravities. A fine unwetted heavy dust will float on the surface of the water, and a colloid will sink only with great difficulty, even when wetted.

For this reason the flotation experts believe that coal, which so freely floats on an oily froth, can be best separated by that method. Of course, a particle of coal with a thin ashy exterior may tend to sink, which we might not want, and one with an ashy heart may float satisfactorily, despite the fact that it should be rejected, but these conditions are so infrequent that the difficulty rarely would be encountered.

One great advantage claimed for the flotation method is that with it fusain, or mineral charcoal, will be rejected if the right flotation medium is used. Fusain is regarded as the substance which interferes with coking. It is said that many non-coking coals would coke if their fusain were removed and that coals that refused to coke have made good metallurgical coke when this deleterious material was eliminated.

Little claim is being made for the removal of pyrite by flotation. It is found that the pyritic content of coal can be slightly lowered thereby, but the reduction is not large. Perhaps a combination of flotation and gravity methods may solve the difficulty, the gravimetric methods removing the sulphur and the flotation eliminating the ash after the coal has been crushed.

Another feature with flotation is that oil covers the mineral substance with a thin film. As a result any water mixed with the coal can be eliminated in the briquetting press, and coal, it is asserted, can be briquetted with less binder and with binders of a less expensive character than is possible where the flotation method does not precede briquetting.



Maintenance and Repair Methods in the Shops of the Consolidation Coal Co. at Jenkins, Ky.

How Split Gears Are Welded Solid—Locomotive Tires Rebuilt by Welding at Cost About Half That of New Tire—Restoring Rail Benders—Protecting Edges of Concrete Floor in Motor Barns

By Alphonse F. Brosky*
Pittsburgh, Pa.

EXTENDING along the main street at the lower end of the town of Jenkins are the shop buildings in which are made practically all repairs for the mines at Jenkins and McRoberts and some for the Millers Creek Branch of the Consolidation Coal Co. at Van Lear, Ky. As is customary with most isolated coal-mining operations, the shops are equipped to make almost any kind of repair, and consequently the department includes a carpenter shop, a blacksmith shop, a plumbing shop, a welding shop, an electrical repair shop and a brass foundry.

In the carpenter, or wood-working, shop finished lumber is manufactured for houses from rough lumber obtained in part from the sawmills of the company and in part from the open market. Not only is the wood for building prepared and cut to proper sizes in this shop but here also are made brake shoes for mine cars, tamping rods, trolley poles, stakes and plugs for the engineering department, motor bumpers and other miscellaneous materials. Occasionally in slack times small pieces of furniture are made so as to keep the working force intact.

Wood-Working Machinery Unusually Complete

The equipment in the wood-working shop includes a tenon-making machine, three planers, an auger press, two lathes for turning wood, one band saw and two disk saws. An interior view of the carpenter shop with its machine equipment is shown in Fig. 1.

In the blacksmith shop, adjoining, several men are employed rebuilding wagons and repairing their wheels.

An adjacent building houses the brass foundry and the welding shop. In the foundry, castings of all descriptions are poured. The jobs include the making of journal brasses for locomotives, bearings, bushings, adjusting nuts, quill bushings and other pieces which might be needed in an emergency. As an example of the variety of work done in these shops it may be noted that when the management found that the filter pumps, which carry the water from the lime tank to the clarifying tanks in the filtration plants, required frequent repair it decided to make these pumps and parts in the company's own shops.

Split Gears Waste Time and Come to Grief

Disregarding the customary jobs of the welding shop the process of welding split gears for mine locomotives is worthy of particular note. Though split gears have been welded by companies for years, the method of procedure of the Consolidation Coal Co. gives so strong and true a gear that a description of the work should be of value.

It has been calculated that at a mine of 2,000 tons daily capacity having locomotives equipped with split gears the machine boss or his helper spends 6 to 8 hours each week in tightening loose gears. Aside from the saving of this time, split gears should be made solid because a gear which is loose on the axle will spoil the retaining pin and slots and ruin the axle.

It is not difficult to weld a split gear so that it will have the necessary strength but it is not easy to do it and at the same time maintain the hub, or bore, so that it will fit the shaft correctly and the teeth so that they will be truly centered during the welding and after the piece has cooled.

The edges of the split gear are beveled with an

Note—The headpiece of this article shows the shop buildings of the Consolidated Coal Co., at Jenkins, Ky., in which is repaired the machinery from fourteen mines in and about Jenkins and in which special work is done for the mines at Van Lear, in the same state.

*Assistant editor, *Coal Age*.

acetylene welder, as illustrated in Fig. 2, thus providing a larger bonding surface. Sometimes the bore of the hub is cut out in a V-shape at the split; especially is this done when stock must be added to the bore in any event to take up the play caused by wear. Then the exposed surfaces are ground to insure a good bond between the metal of the gear and the filler. A mandril of a diameter exactly that of the axle of the locomotive is fitted in the hub of the split gear, and the bolts are tightened up so as to assure that the gear will not be of variable diameter, as there always is some clearance between the two halves which must be adjusted by holding open the hub of the split gear. Otherwise the bonding metal, applied with an electric-resistance welder, would contract and draw the two halves together. Then the gear would not fit over the axle nor would it mesh properly with the drive pinion. Sometimes also the nuts and projecting bolt ends are fused together by means of the torch.

The gear is forced on the axle with a pressure of 50 tons. If the bore is worn and has to be built up, the time required to complete the job is about 4½ hours. If no stock is added to the bore, the work is accomplished in 2½ hours. Of forty-eight gears made solid in the manner described, only two have been known to fail.

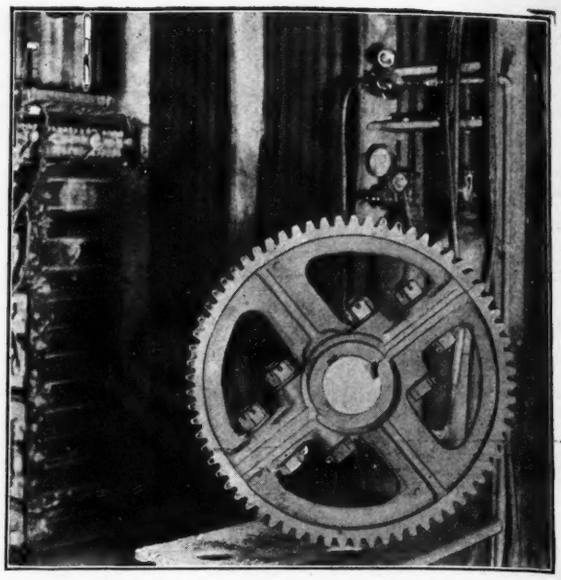


FIG. 2—WELDING SPLIT GEAR OF LOCOMOTIVE

The edges of the surfaces where the two halves come together are beveled with an acetylene welder, and the bore of the hub may be beveled also at the split. The edges are then ground. The wheel is fitted on a mandril, and the bolts are tightened so as to make the gear of the exact diameter designed. Then the wheel is welded by electricity, which makes a true gear with all teeth of equal pitch.

Machine Shop Builds Up Worn Locomotive Tires

Several interesting repair jobs are done in the machine shop, most important of which is the building up of worn locomotive tires, using a motor-generator welding apparatus. The general arrangement of the revolving holder for the tire being repaired is shown in Fig. 3. The wheel holder consists of a horse which is pierced by a threaded shaft on one end of which is a spoke cross which holds the tire. The tire is made to encircle the spokes and is then held by two wooden wedges.

In applying the iron to the tread of the tire one complete revolution of the wheel moves it toward or away from the operative through a distance equal to the lead of the thread, which also is its pitch, as the thread is single. Thus the electrode is relatively the same distance in front of him whether he is applying the metal at the flange or on the opposite edge of the groove in the tire. This gives him greater support for his hands and a more facile control of the molten metal which is being threaded around the tread, because he moves the electrode across the tire in practically the same path at all times.

He revolves the wheel slowly by pressing his foot against the spokes. The thickness of iron applied to the tire depends upon the wear to which the tire was subjected. A considerable saving in the maintenance of locomotives is effected in this manner.

When the tires of railroad locomotives were first

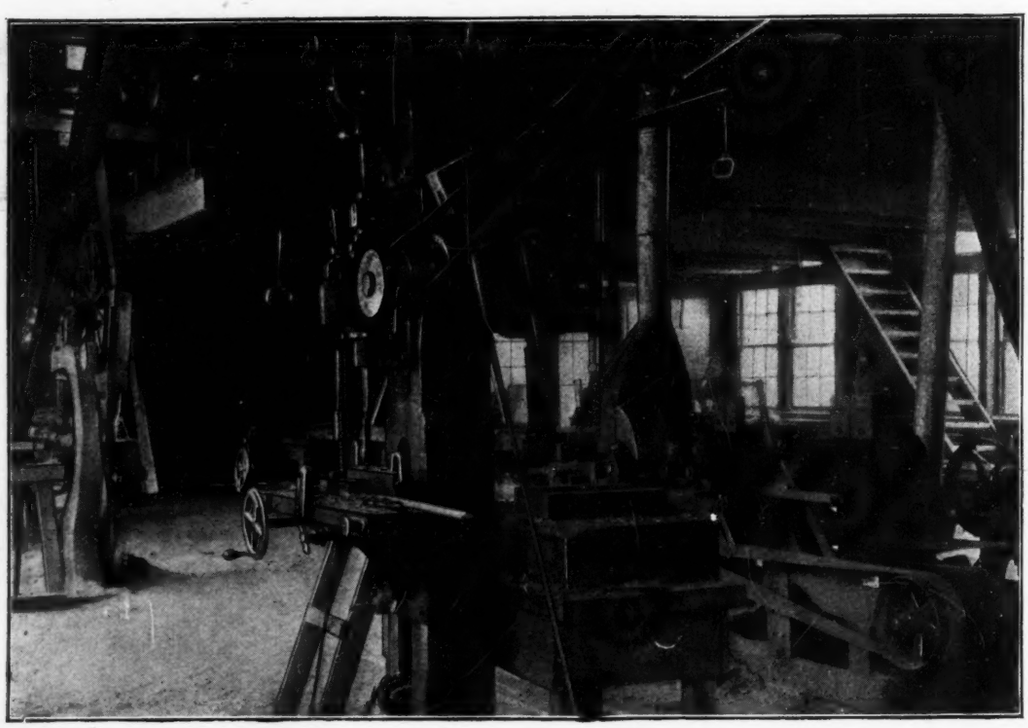


FIG. 1

Carpenter Shop

Modern woodworking machinery eliminates in this shop much of the handwork otherwise necessary in jobs of all kinds, especially cabinet work. The auger press in the foreground and center bespeaks how modernly this shop is equipped. Brake shoes are made for mine cars, tamping poles for loading auger holes, trolley poles and bumpers for locomotives and stakes and plugs for the engineers. In slack times even pieces of furniture are manufactured. The shop contains, in addition to the auger press, a tenoning machine, three planers, two wood-turning lathes, a band saw and two disk saws.

built up by electric welding, several of the carriers put the tires back in service without surfacing the tread. The Interstate Commerce Commission ruled that all tires which are rebuilt must be ground. Some men in the coal industry are of the opinion that tires which are rebuilt by electric welding may be put back into service without surfacing the tread. This is a mistaken belief, at least the Consolidation Coal Co. thinks so. Accordingly, behind the welding operative in Fig. 3 may be seen a 76-in. wheel lathe that will be equipped with a small grinding wheel shafted to a specially improvised turnstock. This will be used to true the tires after their treads have been welded.

New tires give about fifteen months' service and form a ⅜-in. groove before they are repaired. If the false flange is turned in a lathe, the Consolidation Coal Co. has discovered, the tire will give further satisfactory service but for no longer than four months. Then the tire must be discarded. On the other hand, a built-up tire can be used daily for ten months without needing rebuilding, and there is no limit to the number of times this can be done.

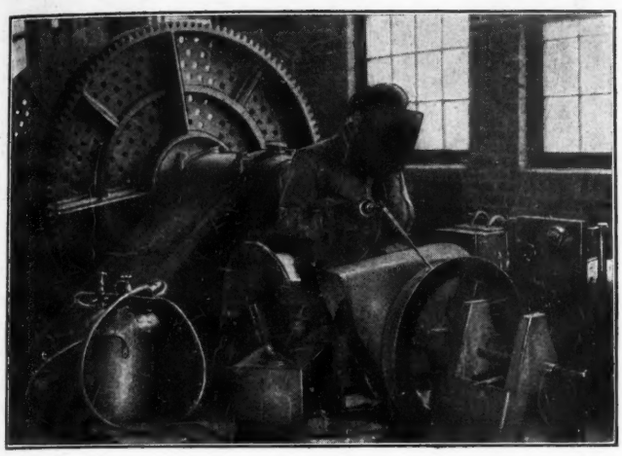


FIG. 3—BUILDING UP WORN LOCOMOTIVE TIRE

Tires at the Jenkins mines, when worn, are built up by electric welding. The illustration shows the way in which the point at which the welding is being done is kept at a uniform and convenient distance from the welder. The large wheel lathe behind the operative will be used to grind the tire after it is built up.

Another interesting repair job is that of overhauling worn rail benders. Due to the enormous pressure which necessarily is placed upon the threads of a 40-lb. rail bender, the nut wears down until it will no longer hold the screw. Then the bender either must be repaired or else thrown on the scrap pile. The screw is not worn out at the same time as the nut, because the former has many more threads than the latter and thus is able to withstand the wear.

One of the methods commonly employed in repairing a worn rail bender consisted in cutting off the claws from the shoulders at *A* and *B* (see Fig. 4), plugging the hole, boring the plug and cutting a thread in it. Afterward the claws were welded onto the shoulders. This method was abandoned because the cost of the repair was almost equal to that of a new bender.

The method used by this company at Jenkins is simple and low in cost, yet the rail bender is made "like new." Referring to Fig. 4, one may see that all that is necessary is to ream out the nut, insert a machine-cut steel tube that is threaded on the inside and has a collar on one end and weld the collar and the protruding end to the body of the rail bender.

Thus far twenty 40-lb. mine rail benders have been remade as specified and all these are still giving satisfactory service after a period of time long enough to make a fair test of the quality and suitability of the work, and quite a saving has been realized.

Periodical Repair a Guarantee of Service

How frequently it happens that companies are entirely pleased with the performance of their underground equipment until it ceases to be new! Then they complain that the machine does not "stand up"? Of course it does not if it receives little or no care. Observations over a period of a few years have brought us to a realization that daily inspections (during which times minor repairs are made if necessary) and periodical overhauling are needed to obtain maximum efficiency and real economy in operation.

In an article dealing with the mines of the Consolidation Coal Co. near Jenkins the methods of maintenance of the arcwall cutting machine will be explained. The moving parts of all mining machines will wear, some parts in a short time and others after a longer period of service. When the parts are thus worn the machine no longer functions correctly. The coal cutters used in the mines of this company are taken one at a time to the shops, where they are torn apart from end to end, so that no two fitting parts are left engaged. This gives the machinist an opportunity to clean the parts thoroughly and at the same time inspect each part for wear. Worn parts are replaced, or if the piece is large it is built up with a welding outfit and then machined. An arcwall coal cutter thus torn down and being repaired is shown in Fig. 5.

Track Laying Usually Faulty in Motor Barns

A great mistake has been made throughout the coal fields in the laying of track or, if you will, in the placing of the concrete floor in motor barns. Rails are laid on cross ties as usual, and concrete is then poured flush with their treads, a slot being left, however, on either side of the rail. This construction is objectionable, for sharp corners are left at the edges of the slots. These soon chip off and break as shown in Fig. 6.

The Elkhorn division of this company has two solutions for the problem presented by this breakage. In its No. 201 mine at Burdine the rails are spiked to 8x8-in. oak sills as shown in Fig. 7. It will be noted that the sills rest in a right-angle cutout so as to lie

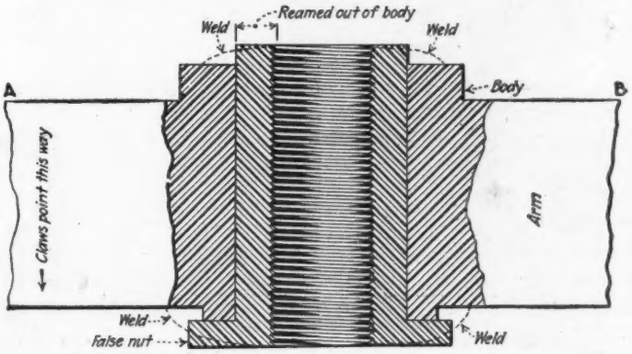


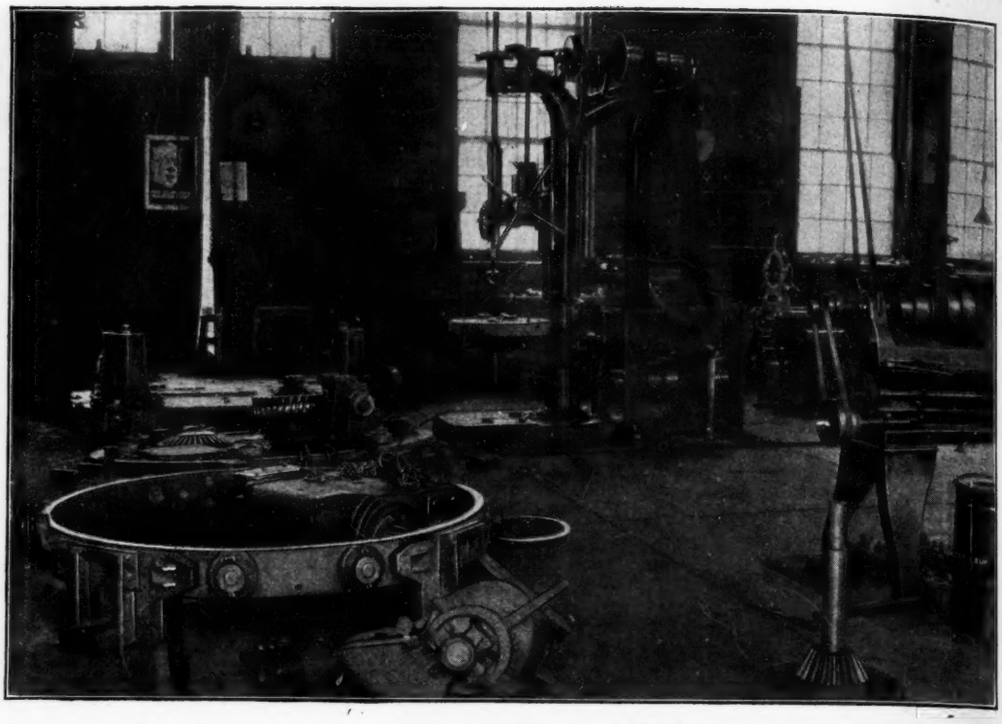
FIG. 4—METHOD OF RENEWING SCREW OF RAIL BENDER

The screw threads on rail benders wear out rapidly in working on heavy rail and become inoperative. The hole can be plugged, the plug bored and the hole threaded, but to do this the claws must be cut off, and when the job is done they must be replaced by welding. To avoid this the nut is reamed out, a machine-cut steel tube is inserted and welded into place, greatly reducing the time needed.

FIG. 5

Overhauling Arcwall Cutter

Too many operators seem to imagine that their machine cutters will go on operating without any attention other than the rewinding of an armature or the replacing of a gear now and again. They need, however, much more considerate attention. The Consolidation Coal Co., at Jenkins, tears its machines down completely and reassembles them, replacing worn parts and building up large pieces, such as the bedplate, where badly worn.



flush with the concrete floor and the walls of the pit. The rails project above the floor. At points away from the pit the sills are cross-braced by wood ties.

The second solution is perhaps the better of the two, as the method of construction is quite simple. At the same time it accomplishes the purpose of protecting the corners of the concrete without elevating the track. Track and concrete flooring thus laid is illustrated in Fig. 8, which is an interior view of the motor barn at No. 214 mine. The work is done as follows: The tracks are laid in the barn on wood ties as on surface and underground tramroads, except that greater care must be taken to put the surfaces of all tracks in the plane of the floor. Oak stringers are spiked to the ties on either side of the rails, leaving approximately a 3-in. slot. The stringers should be flush with the tops of the rails; then the concrete may be poured and readily surfaced, as the stringers act as forms to keep the concrete away from the track. They also aid the men in finishing the floor.

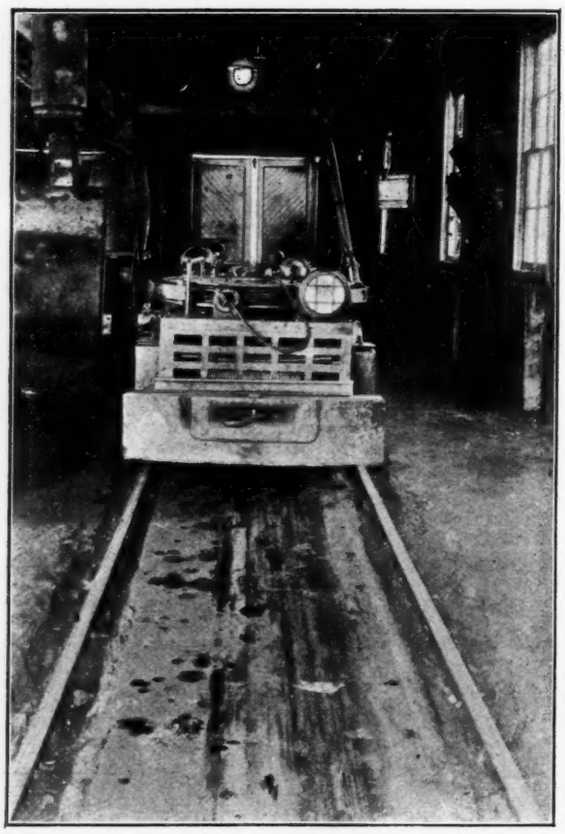


FIG. 6—HOW NOT TO LAY CONCRETE FLOORS IN MOTOR BARN

The floors in most motor barns have broken along the rails just as this has. It shows how with almost perfect tracks locomotives wander around on the rails. To avoid this breakage the Consolidation Coal Co. has made the provisions described in this article.

Figs. 8 and 9 indicate the types of motor barn which this division of the Consolidation Coal Co. believes are best suited to its needs. Though the barn is not an expensive structure, it meets the conditions of these Kentucky mines, for the winter seasons bring more rain than cold. Nor are the barns uncomfortable in the summer, as a pleasant current of air blows through them when the doors and windows are open.

One sometimes wonders why in mild climates motor barns are so frequently built of brick. Where winters are severe a brick structure certainly is necessary to protect the men from the cold. But it appears that brick is preferred also because it is permanent. That would seem a good reason but if a corrugated sheet-iron barn will last half as long as a mine, would it not be better to erect the less expensive structure, when its cost is not more than half that of a brick barn of similar proportions?

With a concrete flooring properly elevated from the ground and drainage facilities provided around the outside there is no reason why the structure of sheet iron should not stand for many years, providing it is given the proper attention, which includes periodical painting of the metal siding and roofing. At the halfway mark in the life of a mine circumstances may warrant a change either in the design or location of the barn. The

old building may then be used for storage or for some similar purpose and a new one erected. The cost of both is no more than the cost of one made of brick, of concrete or of hollow tile plastered with cement mortar.

Sometimes doors are placed on both ends of the barn, and a run-around track allows motors to enter from either end, but the location of the barn in Fig. 9 is such as to prohibit the use of two entrances. Too often motor barns are not kept in an orderly condition but those shown in the two illustrations show the benefit of the stringent rules laid down by the management in this regard.

The barn shown in Fig. 8 will house three cutting machines and seventeen locomotives. Upon close inspection of the illustration one will notice several resistance grids suspended above the right-hand track. These are especially useful to provide a slow charging rate for one or two battery locomotives that may have

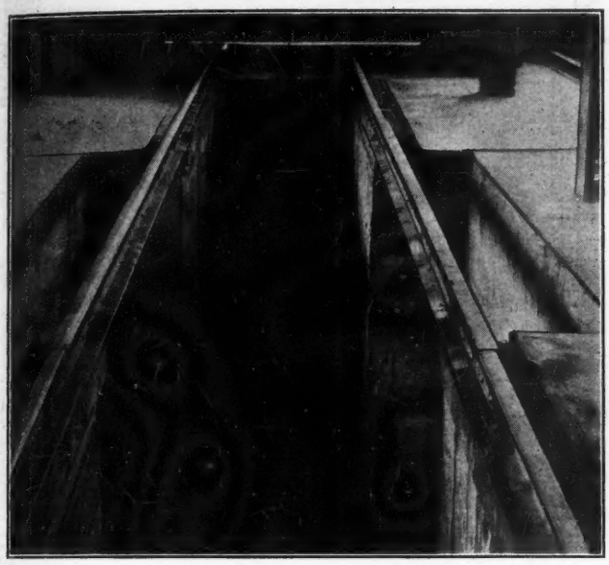


FIG. 7—LOCOMOTIVE PIT WITH UNBROKEN CONCRETE EDGES

Careful inspection of the illustration will show that the track rests on wood sills. These sills, which are of oak, measure 8x8 in. and the concrete is run up to them. The rails, however, project above the floor, which is not a desirable arrangement though less objectionable at the pit. The sills are braced by wood ties wherever the absence of the pit makes this practicable.

been in hard service on a slack day. It is not economical to keep a man on night duty when only a few locomotives have to be charged, and consequently it is well to provide means whereby batteries may be charged at such a slow rate that no supervision will be needed.

Fig. 6 shows a 6-ton General Electric cable-reel gathering locomotive which has been equipped with a new type of reel manufactured by the maker of the locomotive and now being tried at the mines of the Elkhorn division. The reel is driven through a reduction pinion and ring gear. The positive drive provides a satisfactory means of taking up the cable. The old type disk-driven reel causes trouble because it is likely to slip, in which case the cable is not picked up as fast as the locomotive progresses. Because the reel is constructed of steel the electrician at this mine has grounded the reel frame and shaft to the base of the locomotive. Hence if the copper of the cable becomes exposed and comes in contact with the metal of the reel, as it sometimes does, the men will be guarded against shock.

The trolley gate shown in Fig. 10 is located on a

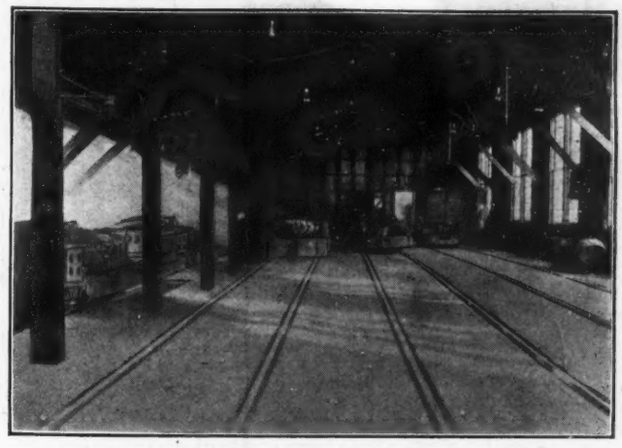


FIG. 8—LOCOMOTIVE BARN WITH WELL-LAID FLOOR

The concrete lies flush with the top of the track and its corners are protected by oak stringers on both sides of the rails, providing a slot approximately 3 in. wide. The stringers are of such a depth that their tops will be level with the running surface of the rails.

tramway connecting No. 204 and No. 207 mines, at a point where it crosses a public road at Dunham as part of a continuous track from Jenkins to McRoberts. During the war, when coal was sometimes hauled on the public road where it crossed the track, a gate keeper was stationed here to prevent accidents.

Such a trolley gate should find application at many mines. Wagon roads, both public and private, often cross the tramroads of mines and the loads on trucks and wagons using the road generally project above the level of the trolley wire. With a trolley gate similar to the one shown the trolley wire is almost continuous, yet the road which crosses the tramroad is not blocked against road traffic.

The manner in which the gate is constructed is quite obvious. Two converging angles are tied together by strap steel and form the bridge. Five angle brackets carry a trolley guard of wood and trolley clamps, to which is attached a bridge wire which merely guides the wheel of the harp across the gate and is not meant to close the circuit. The circuit is diverted to a line carried up and across the poles as shown. Though the wire on the bridge is not part of the regular circuit current can be taken from it by making a connection between it and the ground. Consequently it is necessary to provide a trolley guard.

Mechanical men about the mines have not as yet come to a conclusion regarding the relative merits of

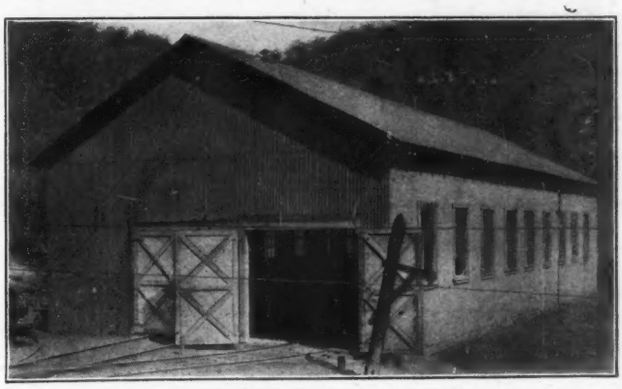


FIG. 9—CORRUGATED SHEET-IRON LOCOMOTIVE BARN

A barn of this type serves every purpose where the winters are not severe and costs about half that of a brick, concrete or stuccoed-tile barn.

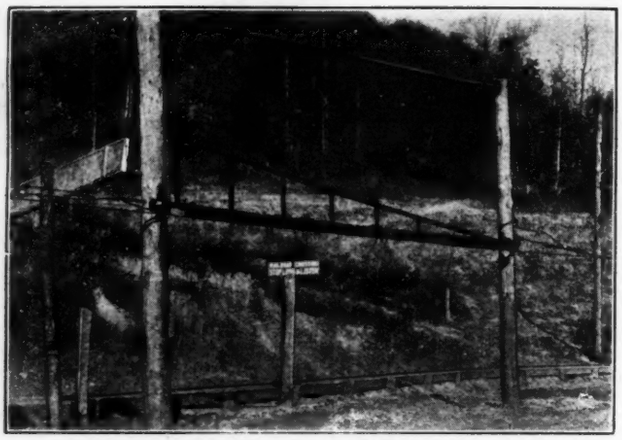


FIG. 10—TROLLEY GATE OVER PUBLIC ROAD

This is a device for swinging the trolley line over places where traffic has to cross the tramroad. The opening of the gate does not break the circuit for that passes at all times through a conductor placed at a much higher elevation. However, when the gate is closed the locomotive gets power throughout its travel and does not have to depend on the momentum of the trip as it does where there is no gate but merely a gap in the trolley line. Besides the gate guides the trolley wheel so that it picks up the wire on the far side of the road.

direct-connected and gear-driven centrifugal pumps as against those for which a belt drive is provided. Many arguments may be made in favor of each type of drive, but the pump operatives of this division of the Consolidation Coal Co. like the belt drive the better because it is more quiet and because the pump may be reached more readily when repairs are to be made. Good belting will last many years even when used in a small pump station hollowed out of the coal and rock. What little take-up is required is adjusted easily. In such a place ordinary steel gears are prone to rust, and then they do not function efficiently. In Fig. 11 is a centrifugal pump of 250-gallons capacity which is belt-driven by a 25-hp. direct-current motor. In rainy weather this pump runs continuously throughout the 24 hours of the day and sometimes for days at a time. About 90 per cent of the pumps are, however, direct-connected.

Slate is disposed of at most of the mines of the Elkhorn division by an endless-rope aërial tramway which carries two 1-ton drop-bottom steel buckets from which the slate is discharged automatically by the tripping of the gate. Two 1½-in. round track steel cables are used for suspending the buckets and a ⅝-in. stranded steel cable which is endless is the motive agent. The endless rope is moved by a horizontal finger sheave which is driven through a pinion and ring gear by a 25-hp. induction motor. The sheave at the upper end of the dump is counterweighted to keep the rope taut.

Slate from the mine is deposited in a 100-ton bin by a kickback dump and is fed into the buckets through the manipulation of a control lever at the bin which operates a counterweighted sliding gate. The slate is carried from the lower bin over two or more towers to the top of a hill. It is further disposed of by one of three methods: It may be dumped from the rope; it may be dumped into a bin on the hill, in which case it may be either distributed by an electric larry of about 8-ton capacity having a revolving body which discharges to either side by gravity over an inclined floor, or it may be slid over the slate bank by means of sheet-iron chutes, as at No. 206 mine, where the slope is approximately 50 deg.

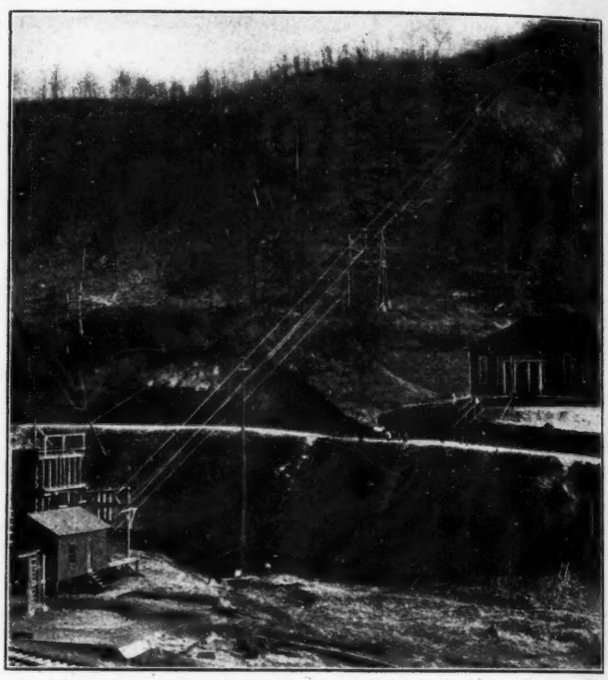


FIG. 12—AERIAL TRAMWAY FOR DUMPING WASTE ROCK

Two buckets carry the slate from a 100-ton bin up the mountain side. The slate can be dropped on the way or dumped into a bin near the top of the hill. In the latter case it is handled either by an 8-ton larry which discharges entirely by gravity or it is dumped from the bin and slides down the slate bank with the aid of sheet-iron chutes.

The general arrangement of the aërial tramway at the joint tipple of No. 207 and No. 208 mines is illustrated in Fig. 12. Here the slate is deposited in a bin at the top and is removed from it for disposal by means of an electric larry. The slate bank in the illustration has just been started. Any one of the three methods of disposing of slate by means of an aërial tramway requires the services of two men.

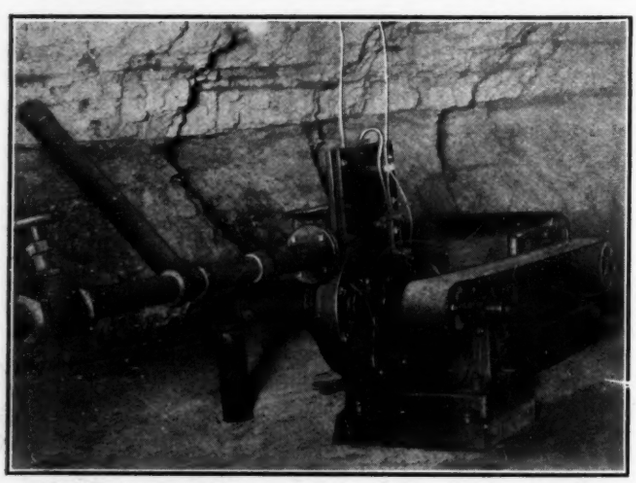


FIG. 11—BELT-DRIVEN CENTRIFUGAL MINE PUMP

Gears underground are likely to rust whereas a belt thrives in these mines, as the air is damp and the temperature never hot. This installation is at Mine No. 201, Burdine, Ky.

COMMENTING ON THE VERDICT in the miners' case an Eastern editor says that "Herrin is a sick community." Maybe that's why they write it Herrin, Ill.—*Nashville Southern Lumberman.*

FRANCE'S NEW SLOGAN seems to be, "They shall not pass—their payments."—*Birmingham Post.*

ALL THAT GLISTENS IS NOT GOLD. Neither are all the black lumps in the bin combustible.—*Boston Transcript.*

Outbursts of Gas and Coal at Cassidy, B. C.

As Much as 1,500 Tons of Coal and Over 1,200,000 Cu. Ft. of Gas Disengaged by a Single Blowout—Mine Has Had 160 Outbursts —Boreholes of No Avail—Wide Places Prevent Recurrence

BY J. B. TOUHEY*
Cassidy, B. C.

THE Cassidy slope is working in what is know as the Douglas coal bed. In order to provide liberally for its ventilation, two intake and two return airways are provided. The main slope or haulage road is driven 12 ft. wide clear of the timbers, the height above the rail being nowhere less than 6 ft. The second intake is used as a manway or traveling road and is driven 9 ft. wide inside the timbers and has a minimum height of 6 ft.

The return airways, of which there are two, one on each side of the intakes, are separated therefrom by a 150-ft. pillar of solid coal, except every 1,000 ft., where the main levels cross them from the main haulage roads. Each district is ventilated by a separate split from the main current, and overcasts conduct the return air over these main levels (Fig. 1).

A splendidly installed Sirocco fan with a capacity rated at 150,000 cu.ft. per minute with a 6-in. water gage is used as an exhaust. It is so located as to make intakes of the haulage road and manway. The volume of air specified is being provided already, but the water gage as yet has reached only 4½ in., principally because of the large size of the airways traversed.

Tests with the Burrell gas detector, which has been found to check up fairly accurately with laboratory tests under normal conditions, show from 0.2 to 0.7 per cent methane in the returns. The slope and manway are driven on the full pitch of the seam, which averages 18 deg., and have been extended about 5,600 ft.

The main levels in No. 1 are driven about every 1,000 ft., and slopes and inclines are driven off these levels from the intermediate panel haulage roads. From these entries level rooms are driven. The output is about 1,000 tons per day. No horses or mules are used underground. The thickness of the coal varies from 1 ft. to 30 ft., the undulations being mostly in the floor and in the middle of the seam, the condition of the roof being fair.

The inclines and slopes are driven 10 ft. wide, and the rooms turned off them have a width of 15 ft. Two certified miners are allowed to each room, no miner's helpers being employed. Permissible electric cap lamps are used for illumination to the exclusion of all other lights. For testing purposes Wolf safety lamps are employed, but they are used solely by firebosses and the management.

The Douglas seam, which, as already stated, is developed at this mine, is the uppermost of the three that are being worked in this district. The Newcastle seam, the existence of which is problematical at this mine, is separated from the Douglas bed by about 175 to 200 ft. of strata which consist chiefly of sandy shale and sandstone in massive formation.

The seam has been subjected to a great geological thrust from the south which has caused the floor and coal to buckle, but the roof apparently has resisted the thrust, hence its fairly normal condition. In consequence of the buckling and sliding of the seam the upper portion of the bed is slickensided and the bedding planes, or stratifications, have been destroyed. The slip planes in the coal sometimes start at right angles to the floor, curving upward, and as these are mostly slickensided it is probable that the slip planes are coated with a clay that is impervious to gas.

In some areas the coal has been thrust or squeezed into irregular and thick masses, these thick coal areas being surrounded by others where the coal has been rendered thin by rolls or even squeezed out altogether. These barriers vary from 100 ft. or so square to several

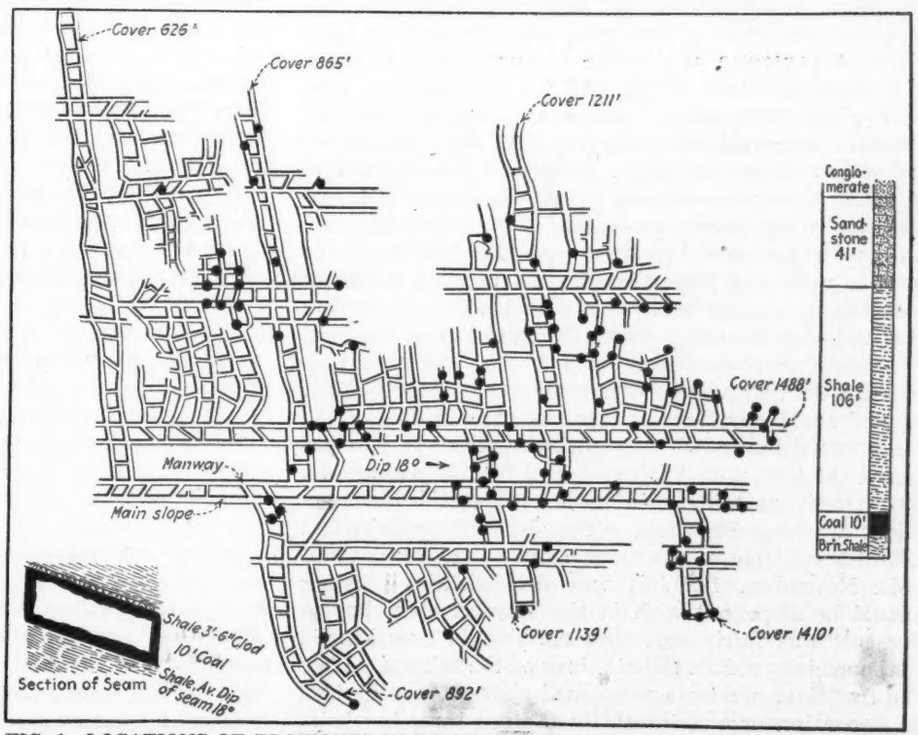


FIG. 1—LOCATIONS OF BLOWOUTS IN DOUGLAS SEAM AT GRANBY NO. 1 COLLIERY

About 160 blowouts have occurred in this mine. It will be seen that they frequently occurred at depths of less than 800 ft. Every evidence points to something other than the present weight of cover as the cause of these blowouts. As in Belgium, the blowouts neither liberate much methane nor relieve the seam of pressure. This map shows only the inner part of the mine.

*Mine manager, Granby Consolidated Mining, Smelting & Power Co.

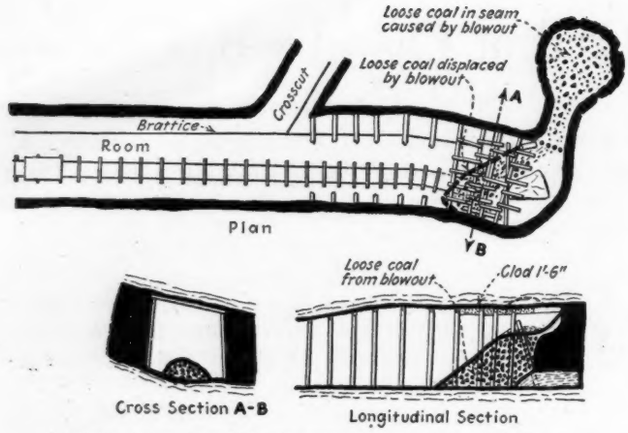


FIG. 2—BLOWOUT IN THE FACE OF A ROOM

This is one of the smaller outbursts. Note the bottle-shaped mouth of the cavity it has formed in the seam. What seems so extraordinary is the fact that areas so different from other areas are to be found in the coal seam. It is a difficult speculation to imagine how they may have been formed.

acres in extent. Careful study has been made to ascertain the relations, if any, between the outbursts of gas and these rolly barriers, but no relationship has been found. The outbursts occur both in thick and thin coal, the geological aspect of the squeezing not seeming to have any effect on the gas pockets.

The outbursts first made their appearance in January, 1921, and from that date until the present about 160 outbursts have occurred, each displacing from 50 to 1,500 tons of coal. The depth of cover under which the first outbursts occurred was about 350 ft., whereas at our lowest present development the cover is about 1,500 ft.

All Blowouts Occur At or Near Coal Face

The accompanying plan (Fig. 1) shows the positions of ninety of the largest outbursts. In studying these it is necessary to remember that, with two exceptions, the outbursts occurred at what was then the working face. These two exceptional blowouts happened after the face had advanced about 40 ft. All the outbursts to date have given premonitory sounds of warning, the coal breaking and cracking at the face. At times this warning will continue for two or three days intermittently; at other times the warning is of only a few minutes' duration. Two forces oppose one another in every outburst: the gas pressure, which exerts a bursting force on the coal, and the strength of the coal resisting movement. As the resistance is reduced by removing the coal, a time comes when the strength of the coal is slightly the lesser force of the two, and from that moment the coal moves. The motion may be only slight and of short duration, as was the case in July, 1922, when two fatal accidents occurred in which men working at the face were buried by coal from two blowouts. The surviving miners in each case testified that a slight warning had been given, but not sufficient to afford them time to get away from the flying coal.

In November, 1921, it was decided that blasting should be dispensed with in the blowout area, but as the coal was fairly soft that revision in practice did not materially reduce the earnings of the miners. After the two fatal accidents mentioned above it was decided to discontinue one of the shifts and put three boreholes at least 20 ft. deep and 2 in. in diameter in every place in the affected area, these holes to be kept 20 ft. ahead of the face. This method has now been employed over three months, but the outbursts are still happening, and up to the present time no pressure has manifested itself in any of the exploratory holes.

The number of outbursts decreased during the month of December owing to a large reduction in the number of places being worked in that area. On the other hand we decided to widen out the rooms to 35 ft. and it is gratifying to know that during the three months in which experiments have been made in this system we have not had a single blowout in a double room, which also accounts for the reduced number of outbursts in December. Our blowouts are unique, as sometimes a second blowout will occur within 20 to 25 ft. from the point where the first one occurred.

The gas would seem to be pent up in in a large number of small pockets under enormous pressure. The liberation of the gas is not instantaneous although the volume given off is extremely large. An outburst on March 20, 1922, displaced 1,000 tons of coal and emitted approximately 1,200,000 cu.ft. of methane in 10 hours. The gas continued to flow in steadily lowering quantity for a further 36 hours.

Much Gas from Blowout; None from Borehole

It is true that sometimes a little gas issues from the mouth of some of the exploratory holes, but at no pressure. Had the gas emitted by the blowout recorded in the first ten hours passed off from three exploratory holes of 2 in. diameter tapped in the seam and had the gas come out of each one of these at 50 lb. pressure per square inch, it would have taken more than five months to drain off the gas that was emitted, but, as previously stated, we have not yet tapped any pressure of gas, and yet the blowouts are still occurring wherever the places driven in the coal are narrow.

A blowout can sometimes be heard 500 ft. away through the solid coal. The sound in most cases resembles the noise made by a rapid-fire or machine gun, and sometimes it lasts three or four minutes. The districts on each air split being small, the miners are enabled to get to fresh air quickly, and they are daily instructed by the officials not to place any confidence in the boreholes but to withdraw to fresh air at the first sign of warning.

As previously stated, the outbursts at this mine are unlike any of the blowouts that hitherto have come to my knowledge. At Fernie, B. C., for instance, the enormous volume and weight of gas constantly escaping from the advancing coal face may cause a shrinkage in the thickness of the coal, which in turn may bring about roof readjustments causing undue pressure and consequent larger outflows or outbursts. Exploratory holes may be of value in such a case.

In the mine under consideration no great volume of gas flows from the coal under ordinary conditions, and the probability of roof readjustments due to disengagement of gas may be safely dismissed. These gas pockets have been formed by the squeezing and crumbling of the coal, the grinding and crushing of which has evolved the gases which are then pent up behind an impervious coal stratum with clay slips. Another peculiarity is the fact that no matter how large the displacement of coal from these outbursts no cavity ever is found large enough to have held such a large quality of coal as has been forced into the workings.

The two following blowouts are typical of these occurrences in our mines, both large and small. An outburst

occurred at 9:30 p.m., Oct. 17, 1922, in No. 7 Level. This level was 14 ft. wide from rib to rib and 13½ ft. high. Timbers were set at 4-ft. centers and 12 ft. between the notches. The face was 55 ft. ahead of the last crosscut. Three exploratory holes had been drilled in advance of the face, the center hole 24 ft. deep and the flank holes 20 ft. deep. The fireboss, on making his inspection, could not get a trace of gas in the place, neither could he get any from the boreholes, though he tried them as late as 8 p.m.

At 9:30 p.m. the face began to be uneasy, and the miners decided to withdraw. They had left the face only 3 minutes when the outburst occurred with a heavy boom, momentarily reversing the air current, raising curtains and opening doors within a radius of 500 ft. When at last an inspection could be made, which was about 12 hours later, the entire level from the center of the crosscut, a distance of 55 ft., was completely blocked with fine coal with the exception of a space about 18 in. square along the higher side rib. Here methane was issuing at great velocity. The outburst came from the direction of the level and right rib and knocked out twelve sets of timbers. After loading out a little more than 800 tons of coal and replacing the timbers the original face was reached, and loose coal was encountered for another 15 ft., but no appreciable space could be discerned from which such a large quantity of coal could have come.

A general sample collected from this outburst screened as in Table I.

TABLE I—SIZES OF COAL EMITTED BY OUTBURST

Screen	Per Cent	Screen	Per Cent
Plus ½ in.	0.0	Plus 80-mesh	9.3
Plus 20-mesh	13.4	Plus 100-mesh	4.8
Plus 40-mesh	26.8	Minus 100-mesh	24.3
Plus 60-mesh	21.4		

Ash content of sample, 30.18 per cent.

An outburst of gas and coal occurred in No. 1 Room, No. 6 North Incline (Fig. 3). This room was 24 ft. wide and the outburst violently displaced 1,500 tons of coal and gave off approximately 1,200,000 cu.ft. of gas in 10 hours. For the next 72 hours the gas continued to be emitted, but at the end of that time the mine was again in such condition that it could be operated. No space that could hold such a large volume of gas could be found.

In order to test the efficiency of exploratory holes a place was chosen that was giving signs of an outburst. This place on Sept. 29, 1922, had three exploratory holes 20 ft. deep. With the exception of a ¼-in. cap of gas coming from the flank hole on the right rib not a trace of methane could be found. The place was stopped and remained idle until Oct. 3, or more than 100 hours.

In the meantime eighteen additional holes, 2-in. in diameter and from 20 to 24 ft. deep, were drilled in an effort to tap the gas. With the exception of very slight gas caps at four of the holes no gas was tapped. A test with the Burrell gas detector at the highest point in the roof showed 1.4 per cent methane. The place was allowed to work on Oct. 3 and after 5 hours' work, when about 10 tons of coal had been mined, an outburst occurred which was unusually violent, displacing 250 tons of coal and knocking out nine sets of timber.

An enormous quantity of gas was liberated for the next 36 hours. On a return to the original face it was found that from 3 ft. to 6 ft. of three of the center holes were in perfect order. Other experiments with exploratory holes have given the same results. Fig. 2 shows a small outburst from the face and high-side rib.

Having witnessed a number of these outbursts and listened to the evidence given by officials and workmen, I have come to the conclusion that not only is the gas under compression but that the coal itself also is equally compressed, the coal acting as a sponge containing the gas. On liberation the coal expands with a consequent effusion of the gases.

Sometimes the loose coal, after it is loaded into the mine cars, is so impregnated with gas that a safety lamp will be extinguished if put on the car. The driving of double rooms 30 ft. to 40 ft. wide has reduced the number of outbursts. In the places where conditions were such that rooms of this width could be driven we have not had a single occurrence of this sort for the three months during which we have been driving them.

In conclusion, from my experience here I believe that

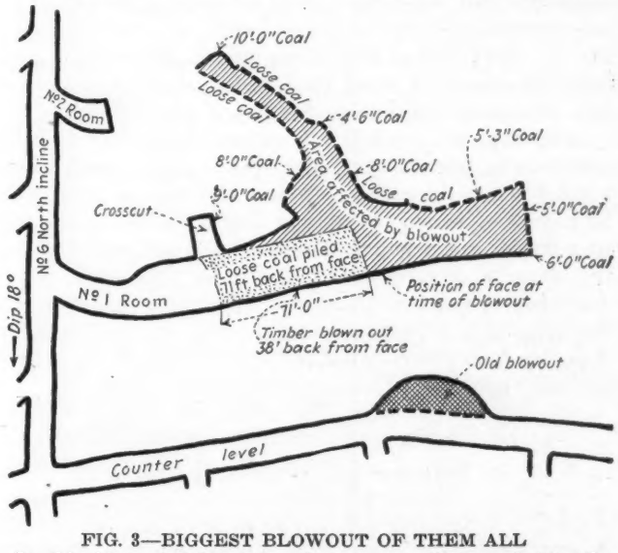


FIG. 3—BIGGEST BLOWOUT OF THEM ALL

In this blowout 1,500 tons of coal was discharged into the heading from an area of weakness of a peculiar shape. Note how the thickness of the coal varies from 4 ft. 6 in. to 10 ft. and quite irregularly. More than 1,200,000 cu.ft. of methane escaped from the self-excavated area.

any mine subject to blowouts of the same nature as at Cassidy should be worked either in double rooms or longwall, where suitable, as this allows the spongy coal and gas more room to expand and the gases will gradually bleed off and prevent sudden liberation.

In places where conditions would not allow either longwall or wide double rooms I would recommend shooting the coal after it is well prepared, either firing one place at a time commencing on the return side of the faces or blasting all shots at once from the surface wherever this would not be contrary to existing mining laws, no one but shotfirers being in the mine at the time.

The great danger we have to guard against, apart from the dangerous condition of the atmosphere after a blowout, is the occurrence of outbursts with only slight warning, which might come suddenly and bury the miners digging the coal. But it might be well to mention what is being done to prevent blowouts or indeed other occurrences from producing an explosion that would involve the whole mine. Districts are small and each district is ventilated by a separate split. No electric signal wires or electricity of any kind are allowed in an affected area.

Barriers of inert dust (flue dust) taken from the

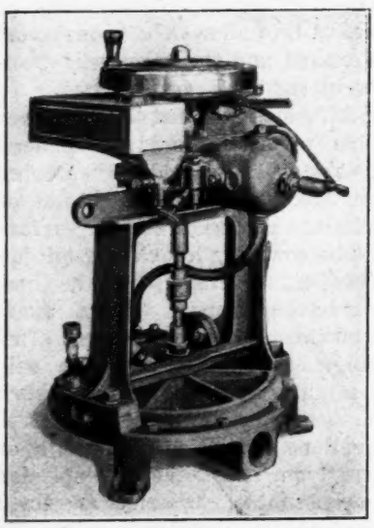
bottom of the smokestack at the boiler house are installed in every level and in the manway and main slope above it. These barriers consist of two 12-in. boards placed side by side and suspended by suitable hangers from the roof timbers at right angles to the roadway. They are placed 4 ft. apart and 6 ft. above the rail. From sixty to ninety of these form a battery of barriers, and each barrier contains 5 cu.ft. of inert dust. In addition to this, at every stopping in the crosscuts between levels and slopes are three of these barriers, each containing 5 cu.ft. of inert dust.

The flue dust has a specific gravity of 0.66 and more than 50 per cent will pass through a 100-mesh screen. In addition to this the intake air is heated on entering the mine by coils or radiators consisting of 4-in. pipe through which exhaust steam from the hoisting engine outside flows into the mine. By means of a bypass, arrangements have been made so that when not hoisting sufficient live steam is allowed to pass through the radiators and enter the intake airways. The steam on the intake does not interfere with the rope runners, for it is arranged so that these men do not come outside with the cars. A man stationed outside detaches the trip and sends the empty cars back into the mine.

A number of very fine fog sprays are placed at 100-ft. intervals on the main haulage roads. These are operated automatically by a large cistern and float arrangement by means of which the sprays are in operation 20 minutes out of every hour. This time for automatic spraying may be arranged at will. The flue dust also is scattered by hand on the ribs and timbers, and of course in applying it a large quantity is deposited on the floor. The fine coal from some of the outbursts assays 50 per cent ash.

Direct-Connected Centrifugal Pump For Construction Work

CONSTRUCTION is the one part of the mining problem to which in many instances but little care and attention is given, and many an operation is started without much equipment other than a few picks and shovels, an auger, a stump puller, a few wagons and some dynamite. One of the first troubles is water, which soon makes its appearance, perhaps in some prospect hole, a waterline trench, the excavation for a bridge pier, an engine or building foundation or a cellar. To remove this water the Evinrude unit centrifugal pump of the Evinrude Motor Co., Milwaukee, Wis., is well suited by reason of its extreme simplicity and the ease with which it is set in operation. The magneto is set at the top of the unit and is of the built-in flywheel type. The power is generated by the explosion of gasoline, the engine being of the same build as has been used for years for motorboat propulsion. A universal joint connects the engine to the shaft, on the end of which is the centrifugal pump. There is but one moving part, the impeller, rotating in perfect balance and at high speed. This will take water either under pressure or from a lower point, the suction lift being arranged not to exceed 20 ft. The pump being free from valves, gears and sliding parts and the passages being large and unobstructed, water can flow through it in great quantity.



HANDY PUMP FOR NARROW QUARTERS

To support the pump shaft at the lower end, a ball thrust bearing has been provided.

The great simplicity of the equipment makes it so light that it can readily be transported by automobile and handled by two men. It weighs only 115 lb. As the motor uses gasoline as the propelling force it is necessary to use the equipment where the ventilation is such that it will remove rapidly and completely any carbon monoxide that may be formed. The 2-hp. type will deliver 6,800 gallons per hour on a level and 6,150 gallons against a 10-ft. head.

Precautions of New York Gas Company To Avert Coal Shortage from Strike

IT MAY be of at least local interest to learn a little of what the gas companies affiliated with the Consolidated Gas Co. [of New York City] have been doing to meet the very exacting demands which the public has been making on them—representing as they do, in a large measure, the most convenient and ready to hand substitute for anthracite coal for the household.

Notwithstanding that 400,000 tons of gas and hard coal were provided to meet strike conditions in April 1, 1922, all of which was New York Tidewater coal, it became clear that coal supplies were necessary from other sources in order to insure a supply of fuel for the winter of 1922-23.

Accordingly contracts were let for a coal bridge of 208 ft. span, using a three-ton bucket and having a capacity of 400 tons per hour, and also for an elevated locomotive crane for cleaning up large cargo sea-going vessels. A dock with 29 ft. at mean low water was constructed for receiving 6,000-7,000-ton vessels, an existing bulkhead was raised and strengthened and construction begun on June 1, while contracts were let for coal from Hampton Roads, first delivery to be Aug. 15.

This coal unloading and storing plant, located on Luyster Creek, Astoria, about three-quarters of a mile from the gas plant, was actually unloading coal from barges a few days after Aug. 15.

It was quite clear that sufficient Hampton Roads coal would not be forthcoming, so that 113,000 tons of "Wear Specials"—England's best gas coal—was contracted for f.o.b. piers England, deliveries in August, September, October and November. About 7,000 tons additional was later ordered. All the English coal but 5,000 tons has been received; 113,000 tons of it in U. S. Shipping Board vessels, with less trouble than one could have imagined possible, and at prices very favorable, considering American spot prices.

So promising had the prospect become for other than New York Harbor coal that additional wharfs and docks have been constructed, and two additional 208-ft. span bridges ordered, so that the wharfage will be 1,600 ft. long.

*From address by J. W. Lieb, vice-president, New York Edison Co., before the New York Electrical League, Feb. 28, 1923.

Chromium, Nickel and Silicon Alloys Best Resist Acidulous Mine Waters

THE results of corrosion tests on forty-five different metals and alloys in the acid mine waters from coal mines, made in the course of a co-operative investigation by the Carnegie Institute of Technology, the U. S. Bureau of Mines and an advisory board of coal-mining engineers are summarized in Bulletin 4 of the Coal-Mining Investigations series, just published by the Carnegie Institute of Technology, Pittsburgh, Pa.

Water from coal mines usually is decidedly acid in character and causes much trouble and expense by its corrosive action on mine equipment. These waters contain free sulphuric acid, and ferrous, ferric and aluminum sulphates, sulphates of calcium, magnesium, sodium and potassium, and in addition silica and usually some chlorides. On standing, dilution, aëration or warming, insoluble iron compounds tend to precipitate, principally as hydrous ferric oxides. The presence of iron sulphates and free sulphuric acid is due to the action of water and air on the pyrite or marcasite associated with the coal. These substances are oxidized to ferrous sulphate, ferric sulphate and sulphuric acid.

In the co-operative investigation made by the U. S. Bureau of Mines and the Carnegie Institute of Technology three test specimens of each of forty-five metals and alloys were completely immersed in flowing water at each of three coal mines in western Pennsylvania for periods ranging from 98 to 135 days. The waters from these mines covered a wide range of acidity, from one considered to be below the average of that region to a water which is considered to be extremely acid. Inspections were made at regular intervals, and the degree and nature of corrosion was noted. At the completion of the test the specimens were removed, cleaned and the extent and nature of the corrosion recorded. Samples of the mine waters were collected at each inspection and the degree of acidity determined. Complete analyses also were made on the waters from the three mines.

Copper-Tin Better than Copper-Zinc Alloys

All the alloys of the brass type, which contained much zinc, when tested, were corroded extensively by the mine waters. Bronzes, containing much tin, also were corroded, but less than the brasses. Evidently copper-zinc alloys are less desirable for use in mine water than copper-tin alloys. Copper-nickel alloys were corroded about as much as the brasses. Nickel-silver alloys, which contain copper, zinc and nickel, also were corroded extensively. Aluminum alloys showed a marked tendency to pronounced pitting.

The materials which showed a marked resistance to the corrosive action of the acid mine waters include a high-chromium steel, two highly alloyed chromium-nickel-silicon steels, a high-silicon cast iron, and a nickel-chromium-iron alloy. All these materials, except the high-silicon cast iron, contain large quantities of chromium. These resistant materials have certain disadvantages for general use in coal-mine equipment, such as brittleness and hardness in case of the high-silicon cast iron and relatively high cost in case of the others; nevertheless, these resistant materials should prove satisfactory for use in pump parts and other equipment where these factors are not a serious consideration.

Economic considerations, such as cost, ease of fabrication and physical properties, will be factors in determining the suitability of a metal or alloy for use in equipment exposed to the action of acid mine water.

Bulletin 4, which has been prepared by W. A. Selvig, assistant analytical chemist, U. S. Bureau of Mines, and George M. Enos, research fellow, Carnegie Institute of Technology, may be obtained from the Carnegie Institute of Technology, Pittsburgh, Pa., at a price of 40c.

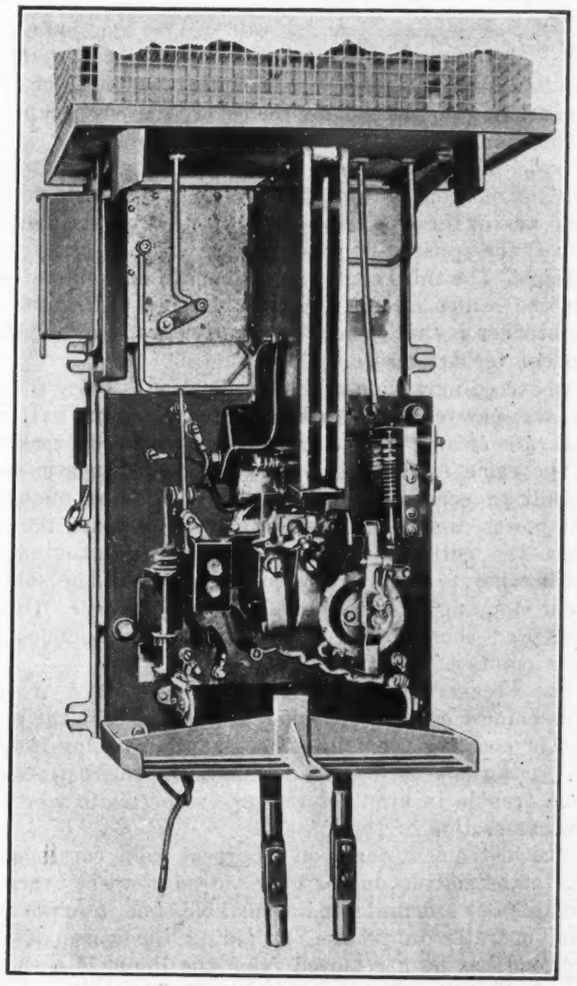
Self-Acting Reclosing Circuit Breaker With Arc Chute and Blowout Coils

By D. J. Baker*
Charleston, W. Va.

A NEW type of automatic reclosing circuit breaker known as the "MSB" and having all of the operating characteristics of the familiar tie-feeder switchboard instrument is now available for mine-sectionalizing service. The new automatic circuit controller which is being manufactured by the Automatic Reclosing Circuit Breaker Co., of Columbus, Ohio, was designed exclusively for outside- and inside-mine duty.

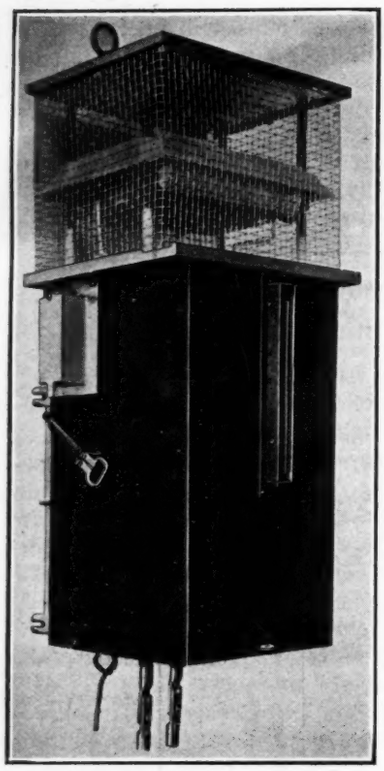
All of the operating parts are front-connected on an ebony-board panel and are so related as to be easily accessible. The panel and a wire-enclosed nichrome resistance unit are mounted on a cast-aluminum frame

*West Virginia manager, the Automatic Reclosing Circuit Breaker Co.



BREAKER PARTS READILY ACCESSIBLE

All parts are arranged on the front of the panel, thus giving easy access for adjustment and quick repairs without any undue inconvenience.



ENCLOSING CABINET WITH SCREEN OVER RESISTANCE
Proper protection is afforded by safety, and resistance unit is well ventilated.

so that the complete outfit may be both compact and light in weight. Two resistance tubes at the bottom of the panel liberate sufficient heat to assure that the operating mechanism will be prevented from rusting or corroding regardless of where the installation may be made. The instrument is rated at 60 amperes for either 250- or 550-volt service but ranges in its overload calibration from 300 to 1,200 amperes. On opening the breaker the arc is broken in an asbestos chute near a magnetic blowout coil. The unit is provided with a black-enameled sheet aluminum enclosing cover which may be locked. A push-button control switch is located in a housing on one side of the cover whereby means is provided for locking the breaker out permanently when desired. The new instrument permits of an exceedingly easy installation, as only three connections have to be made, two of these being positive. These two are used to connect the sectionalizing breaker in series between two sections. The third connection is bonded onto the rail or into the return circuit. Another important feature of the breaker is that it may be used for stub-end or independent feeder service.

An exceedingly wide field of application is being found for the new circuit breaker, which is about half as elaborate as one of the regular switchboard breakers of the same rating. It permits of an automatic sectionalizing scheme being adopted within the mine so that power disturbances in the troubled section do not affect the entire distribution system and thus cause the breaker to open at the substation, with the subsequent stopping of operations from face to tipple. Overloads and short-circuits are automatically confined to their points of origin.

The breaker further permits of feeder and trolley lines being tied together wherever possible for the purpose of boosting the voltage back at the working places, yet giving the various load centers an entire freedom from trouble in event of line or feeder disturbance in another section of the mine.

The instrument opens on a current value corresponding to the setting on the overload adjustment bracket, remains out a definite and adjustable time interval, and then operates to reclose, providing the cause of the overload has been removed from the line. If a short-circuit has opened it, the breaker "locks out" until the "short" has been cleared up. In this connection the instrument also is adjustable so that it may be set to reclose against a predetermined legitimate dead load on the section it controls.

Selective service on various feeders may be obtained by employing the breakers in conjunction with overload relays of either the instantaneous trip or time-cycle type. In this case, when it is desired to divert a high current value to a particular section in order to handle a peak load over a definite or indefinite time cycle other and lesser important sections may be dropped automatically and picked up again when the demand is over. This is especially desirable in plants having heavy grades along their main haulageways where peak loads on these main haulageways combined with other loads would otherwise result in opening the breaker in the substation and thus suspend operations throughout the mine.

Several installations of this nature already made have precluded the immediate necessity for purchasing additional generating equipment, and have maintained higher all-day load factors.

Morbidity Studies as an Aid in Preventing Illness Among Miners*

By R. R. Sayers†

NINE operators and managers for a number of years have known that the maintenance of the health among the workers has an appreciable financial value. In order to maintain the health, it has been found necessary to know: (1) The health hazards existing in the industry as a whole and the specific hazard in the individual mine. (2) The physical condition of applicants for employment as well as that of the old employees. This can be determined only by systematic physical examination of all applicants and of regular employees at intervals of at least once a year thereafter. (3) All cases of sickness that occur among the workers.

No operator or manager, or personnel, medical or safety organization can control or prevent sickness without knowing where, when and under what conditions the sickness actually occurs. In order to obtain information as to the hazards of industry, investigations have been and are being made of the effects of the conditions both in the field under usual working practices and in the laboratory. In the field several factors generally are present which affect the health. The effect of these factors may be determined by studying each of them separately in the laboratory. However, both the field and the laboratory studies are limited in value in that such studies usually have been made over a comparatively short period. While we have some information as to their immediate effect, we do not know to what extent extreme heat, humidity, the presence of dust or other health hazards are the cause of disability.

TABLE I—MORTALITY AMONG INDIANA COAL MINERS (a)

Year	Persons Employed At Coal Mines	Deaths	Rate per 1,000
1916	21,300	260	12.21
1917	23,940	323	13.49
1918	27,932	515	18.44
1919	28,673	291	10.15
1920	27,076	348	12.85

(a) Data taken from the annual reports of the Indiana Industrial Board.

*Report of Subcommittee on Prevention of Illness of the American Institute of Mining and Metallurgical Engineers, New York meeting, Feb. 19-22, 1923.

†Chief Surgeon U. S. Bureau of Mines; surgeon U. S. Public Health Service.

TABLE II—PERCENTAGES OF TOTAL DEATHS IN INDIANA AMONG COAL MINERS, FARMERS AND ALL OTHER MALES, GROUPED ACCORDING TO CAUSE, 1916-1920

Cause of death	Miners	Farmers	All Other Males
Typhoid fever	1.15	1.39	1.19
Influenza	11.10	6.34	5.60
Pulmonary tuberculosis	6.45	7.71	12.90
Other tuberculosis	0.86	1.49	1.19
Other respiratory diseases	9.15	9.10	10.08
Diarrhea	0.75	1.57	1.23
Syphilis	0.63	1.11	1.52
Cancer	3.51	7.10	5.16
Alcoholism	0.63	0.08	0.53
Apoplexy	3.28	9.32	7.43
Other diseases of the central nervous system	1.67	4.19	2.97
Diseases of the heart	8.75	15.71	14.05
Other circulatory diseases	1.15	3.56	3.03
Append. & Int. Obstruc.	1.50	1.62	1.77
Cirrhosis of the liver	1.09	0.78	1.64
Nephritis	5.00	11.52	9.64
Suicide	1.73	1.14	1.48
Mine accidents	26.20	....	....
Other accidents	9.78	5.18	7.87
All other causes	5.64	11.12	10.60

Mortality statistics probably are the most easily available indices as to the hazards of industry. As an example, a study of such statistics among coal miners of Indiana shows a marked increase in the death rate in 1918.

The increase in the death rate in 1918 was not entirely due to the industry but to the general epidemic of influenza. However, the proportional death rate of miners for the five-year period 1916-1920 shows that 11.1 per cent of the deaths were caused by influenza, as compared with 6.34 per cent of the deaths due to the same cause among farmers and 5.6 per cent among all other males.

While the miners had a larger percentage of deaths due to influenza over the five-year period than either of the other groups, the percentage due to accidents was the most striking. More than one-fourth (26.2 per cent) of all deaths among miners was the result of mine accidents, largely falls of roof, coal, rock, etc., and explosions. About 10 per cent (9.78 per cent) were due to accidents other than mine accidents, as compared to 5.18 per cent among farmers and 7.87 per cent among all other males. While proportional death rates may be somewhat misleading, it is quite evident, when almost 36 per cent of all deaths are due to one cause, accidents, where the greatest efforts to save life should be made.

While the data obtained from morbidity statistics are of material aid in the prevention of sickness, they only show the last illness and give no information as to previous health conditions of the individuals. Furthermore, no information is given as to the exact nature of their work other than a general statement as to occupation. It is this limitation of the knowledge supplied by death certificates that makes sickness records so necessary to lessen or eliminate the health hazards of an industry.

All operators are interested in knowing how much working time is lost by the employees and how much of this absenteeism is due to sickness. Many of the larger companies, and some of the smaller ones, have the requisite organization to determine the effect of different kinds of work and working conditions on those exposed in terms of frequency and severity of disability. Some plants now obtain this data and use it; others obtain it but make little or no use of it. One lead smelter in the United States has a full-time medical and safety organization which makes physical examinations of all applicants for employment and at intervals thereafter. Sickness records are kept of all illness. This company decreased the yearly incidence of lead poisoning from 87 to 35 cases in four years.

Usually there is no valid reason why companies having a full-time plant or mine physician cannot record what is happening to the health of the population in which they are interested. Records of sickness, of course, are kept in practically all establishments which provide medical service for employees, but usually they cover only those cases that are treated in the plant dispensary or company hospital. Obviously, a record of *all* the cases occurring in the population under study is necessary for determining the relative frequency and severity of disease according to occupation. It also is necessary to have available the same set of facts for the persons not sick as for the persons sick so that comparisons can be made in terms of rates per 100 or 1,000 persons in any given period. A card (5x8 inches), used by the U. S. Public Health Service and several large industrial plants, is suggested as being suitable. Reprint 573, Public Health Reports, gives an explanation of the terms used on this card.

Name..... No.....Sex.....Plant.....
Address.....
Race..... S M W D.....
Country of birth (of self)..... Yrs. in pres. occ. prior to date this record begins.....
Country of birth (of father)..... Previous occupation and industry.....
Country of birth (of mother)..... Years in previous occupation.....
Age in 1923..... Length of service with Co. prior to date this record begins.....

DEPARTMENTS AND OCCUPATIONS WORKED IN SINCE DATE THIS RECORD BEGINS

From	To	Days ex	Dept.	Occ.	From	To	Days ex	Dept.	Occ.

Defects—1st. Ex.....
Defects—2d. Ex.....
Defects—3d. Ex.....
Defects—4th Ex.....
DATES: 1st. Ex..... 2d. Ex..... 3d. Ex..... 4th Ex..... 5th Ex.....
PEC. 1st. Ex..... 2d. Ex..... 3d. Ex..... 4th Ex..... 5th Ex.....
Date Employment Ended.....

INDUSTRIAL MORBIDITY FORM A, STATISTICAL OFFICE, U. S. PUBLIC HEALTH SERVICE

Name.....No.....Sex.....Plant.....

Date Absence Began	Date Returned To Work	Cal. Days Lost	Cause	Diagnosis of Sickness or Injury	By Whom Diag.	Termination

INDUSTRIAL MORBIDITY FORM A, STATISTICAL OFFICE, U. S. PUBLIC HEALTH SERVICE (REVERSE SIDE OF CARD)

The card shown will serve as a record of personnel and of sickness among the personnel. To be of current value it is necessary to put in monthly tabular statements the number of personnel, the number of cases of sickness occurring among them, and the sickness rate per thousand persons for any group desired. The record of sickness may be obtained from the card without difficulty if signals distinct from personal signals be attached.

The Public Health Service,‡ in co-operation with the U. S. Bureau of Mines, is prepared to assist companies which wish to inaugurate a system of morbidity records by sending a representative to confer with the company and to help revise a plan of records. The co-operation of the employment department and the medical department of the company in the keeping of

‡Information supplied by D. K. Brundage, assistant statistician U. S. Public Health Service.

morbidity records is essential. There must be a card for each employee, whether he is ever sick or not, containing much the same personnel data as are recorded in the employment department: Age, nationality, length of service with the company, etc. These facts about the employee must appear on the same card showing the chronological record of disability in order to make possible the correlation of cases of sickness with age, length of service, etc.

Canadian Mining Institute Discusses National Fuel Supply of Dominion

By W. A. Lawrence
Montreal, Can.

CANADA is perplexed over its fuel supplies from the United States and, as a result, there is an insistent demand from some of the leading dailies that she take time by the forelock and either insure a sufficient supply without depending upon the coal fields of the United States, or, better still, find substitutes for the fuel now being used.

That the matter is one of grave concern to the Canadian people was borne out by the fact that the Canadian Institute of Mining and Metallurgy, at its annual meeting in Montreal, March 7-9, devoted the entire session, extending over three days, to a discussion on the fuel situation. Many of the leading fuel experts of the United States were in attendance and presented well-considered views on the relation of the United States to Canada in so far as fuel supplies are concerned.

Undoubtedly the Canadian consumers—they purchase 22,000,000 tons a year from the American coal fields—are seriously perturbed; so much so that they have even gone to the limit of accusing the American operators of discrimination. In this unqualified charge, however, they have lost sight of several important facts, as papers, delivered by American experts, indicated.

United States Giving Canada Fair Quota

For instance, George H. Cushing, of Washington, in his paper on "United States Bituminous Coals Available for Canada," pointed out that the recent shortage in Canada was not due to a malignant desire on the part of United States operators to hold up their Canadian customers. Rather it was due to factors over which they had no control, and, further, it amounted, in the opinion of Mr. Cushing, to an almost unpardonable libel to suggest that American dealers were unfair.

As he pointed out, the coal shortage was due to the simultaneous expiration of the contracts between union miners and union operatives, "a combination of circumstances which is hardly likely to recur."

When the coal situation as between Canada and the United States was brought down to the fine point, as Mr. Cushing explained, it was essentially a matter of transportation. As he said, "I believe it is going to prove easier to buy coal than to have it carried," which disposed of this matter almost in a nutshell.

Enlarging on the problems facing the American operatives, he recalled how, in the earlier stages of the war, the United States inevitably was forced into supplying the needs of the allies as a result of which it accumulated a large working surplus. This was invested in the ownership of mines and factories. Unfortunately, one fatal mistake had been made; rail transportation had not been developed commensurately with the progress of industry. The merchant marine, however, had been greatly overdeveloped.

"Putting it bluntly," he said in his summary on this point, " we have far and away enough coal productive capacity to satisfy all Canada's demands for fuel but we have such comparatively small rail transportation facilities that we cannot take care of our own needs and Canada's unless we both apply ourselves assiduously to the development of our water-borne traffic."

American operators, he contended, were forced to select customers who were so situated as to assure the quickest return to the mines, but, he thought, Canadians could help by insisting upon a quick return of coal cars.

Must in Future Do with Less Anthracite

J. F. K. Brown, chief engineer of the Hudson Coal Co., dispelled a few illusions also in his paper on the "Relationship of the Anthracite Fields to Canada," the first one of which was that there had been no progress in coal-mining operations. He pointed out that, owing to the diminishing supply of anthracite, it was likely to be extensively supplanted by soft coal and other fuel. As regards this possibility, he thought any change will come about gradually and it will be taken care of by the consumer, who, as time goes on will create a demand for another and more economical method of heating as he finds that the cost of his present system slowly increases.

Costs of production naturally will increase because the best coal has long since been mined and, of necessity, operators now have to dig deeper and use more expensive machinery to meet their requirements.

R. J. Lee delivered an address on the "Lignites of Saskatchewan." He stated that the deposits were discovered in August, 1857, by Dr. Hector and Captain Palliser, of the Palliser expedition, who had heard reports as to the presence of the mineral from Indians and half-breeds. In 1880 Hugh Sutherland shipped coal by barge down the Souris River and other waterways to Winnipeg.

The principal lignite mining region in the province of Saskatchewan is around Bienfait, Estevan and Roche Percée. Here are four seams varying from 3½ to 15 ft. in thickness, the average being 8 ft. From this area 90 per cent of the present lignite production of Saskatchewan is produced.

Roof Too Weak for Longwall Workings

Longwall has not been found successful, probably because there is no solid rock formation between the tops of the seams and the surface. No difficulty has been experienced, however, in working rooms to a width of 25 ft. No inflammable gas has been encountered, but fires, says Mr. Lee, have broken out at several of the mines and, in the spring, water is a source of trouble, as it readily enters the mines through the light surface cover. The plants in aggregate could produce 3,000 tons per day if they could find a market for their product. When the lignite is dried and pulverized it is extremely liable to spontaneous combustion, which makes it difficult to store. It also reabsorbs moisture freely. This interferes with its use pulverized. Certain technical difficulties have been found to interfere with the briquetting of dried lignite. Briquets have been made containing: Moisture, 6 per cent; ash, 14 per cent; volatile matter, 16 per cent; fixed carbon, 64 per cent. The fuel gives 11,700 B.t.u.

D. B. Dowling, of the Canadian Geological Survey, adds Mr. Lee, estimates the total lignite resources of

Saskatchewan at 58,000,000,000 metric tons. This estimate includes all coal seams of 1 ft. or over and to a depth of 4,000 ft. The lignite has 33 per cent of moisture, 27 per cent of volatile matter, 7 per cent of ash, 33 per cent of fixed carbon and 9.5 per cent of sulphur, and delivers 6,500 to 7,500 B.t.u. The lignite is sold at a low figure, for whereas the average selling price of coal at Canadian mines is $4.97 per ton the average selling price of Sasketchewan lignite is $2.40 per ton. So far the field has conducted its operations without lengthy strikes.

Ontario Has the Most; Quebec the Best Peat

B. F. Haanel, in an exhaustive paper on the "Peat Resources of the Central Provinces and Their Utilization for Fuel Purposes," said:

"The peat resources of Ontario are estimated to cover approximately 10,450, those of Manitoba 500, and those of Quebec 500 square miles, but of this large area only a very small portion, favorably situated with respect to inhabited communities and transportation facilities, has been surveyed and examined in detail. Only this portion, therefore, will be considered in discussing the value for fuel purposes of the peat in the central provinces.

"Eighty-eight peat bogs situated in this part of Canada, with a combined area of 330 square miles and representing 114,000,000 tons of standard peat fuel, have been examined in detail. Forty-six of these bogs are situated in Ontario, 27 in Quebec and 9 in Manitoba.

"The calorific value of the bogs examined so far in the Province of Ontario varies between 7,000 and 9,000 B.t.u. per pound. It is noteworthy that the peat of the bogs so far examined in Quebec appears to be of a better quality than that found in Ontario, the heat content varying between 9,000 and 9,760 B.t.u. per pound. In every case the heating value refers to absolutely dry peat. This is a very high heating value for Canadian peat and compares favorably with that of the peat found in Ireland. The ash content of the Ontario bogs so far examined varies between 4 and 26 per cent, but a large number of the bogs have an average ash content around 6 to 7 per cent. Here again the advantage appears to rest with the peat bogs of the Province of Quebec; their ash content is exceedingly low, varying between 2 and 8 per cent, and the average percentage of ash in all the bogs of that province is considerably below 8 per cent.

Low Ash and Sulphur and High Nitrogen

"Chemically, peat differs markedly from solid fuels in that it has a high percentage of oxygen—about 33 per cent—a high content of volatile matter, a low content of fixed carbon, and generally a comparatively high content of free nitrogen. The latter makes peat fuel especially valuable for utilization in a byproduct-recovery gas producer, in which over 70 per cent of the nitrogen of the fuel may be recovered as ammonia. The sulphur content of peat is very low; almost negligible.

"Peat coke for this reason is a most desirable metallurgical fuel. The ash content is not only low, as a rule, but non-fusible under ordinary conditions; therefore high temperatures can be maintained without the production of troublesome clinkers. The heating value, as already stated, is determined for absolutely dry peat, but when peat is used as a fuel its moisture content varies up to 40 per cent.

"If the raw-peat substance contains 88 per cent water and 12 per cent combustible substance—that is, 240 lb. of combustible matter and ash per 2,000 lb. of raw peat—and if the heating value in the absolutely dry state is 9,000 B.t.u. per pound, there would scarcely be sufficient heat available to evaporate the moisture content, assuming perfect drier efficiency and that this heat could be made available.

"The evaporation of the total water content by the application of artificial heat has not proved economic, and it has been amply demonstrated that the bulk of the associated water must first be removed by other means before artificial heat can be employed for removing the remaining moisture. In drying at atmospheric pressure, the larger part of the heat required is represented as latent heat of steam, namely, 970 B.t.u. per pound of steam formed, and this heat in practice is totally lost.

Drying by Artificial Heat Unprofitable

"Several attempts have been made in Canada and other countries to briquet raw peat when dried below 10 per cent moisture, without the employment of a binder, the object being to produce a compact and more attractive fuel and one in which the rate of combustion would be less rapid than is the case with ordinary air-dried machine peat. The reduction in volume, it also was realized, would be a great advantage; but in order to furnish the dry peat for briquetting, the original water content had to be partly removed by artificial heat, as in the case described above. Much money has been expended in an attempt to perfect a process for manufacturing peat in this manner, but this money was lost, due entirely to the cost of drying and briquetting.

"Based on the performance of the experimental combination plant at the Alfred (Ont.) bog and the estimated cost of an entirely new and remodelled plant, complete with an efficient power unit and larger macerator, the production and other costs of the finished peat per ton are estimated to be:—

	10-Hr. Day	20-Hr. Day
Production costs	$2.00	$2.00
Overhead costs	2.48	1.50

"Thus the total cost of finished peat fuel on board cars at the siding of the plant would be $4.48 for a 10-hr. day, for a season of 100 days, or $3.50 for a 20-hr. day during the same season. The total production of salable fuel in the first case would be 10,000, and in the second case 20,000 net tons. Overhead costs, however, increase rapidly as the production decreases; consequently the committee recommends that plants of this type be operated for twenty hours per day. The figures for production costs include an ample allowance for cost of raw fuel, paid for on a royalty basis, and for clearing and draining the bog.

Has Half as Much Heat as Anthracite

"Standard peat fuel, as manufactured at Alfred, has a heating value of about 6,500 B.t.u. per pound, whereas the average anthracite now coming into Canada has a heating value of about 12,500 B.t.u. per pound. Standard peat fuel has a moisture content of 30 per cent.

"Theoretically, therefore, it takes about 2 lb. of peat to give the same heating value as 1 lb. of anthracite. This is based on a comparison of the theoretical heating values of the two fuels. In practice, however, a comparatively large portion of coal passes through the grates unburned, and is entirely lost, whereas the peat is entirely consumed. In mild weather, owing to the difficulty in controlling a coal fire, much heat is wasted or the fires go out. With the peat fuel this is not the

case. This is a distinct advantage which peat has over anthracite.

"The value of the nitrogen contents of our peat bogs will be better appreciated from the following calculation: The fuel content of the peat bogs examined in detail in Manitoba, Ontario and Quebec is estimated at 114,000,000 net tons of fuel having a 25-per cent moisture content. This reduced to the dry state is equivalent to 85,500,000 tons, and if the average nitrogen content is 1.75 per cent, the total quantity of free nitrogen available will be approximately 1,500,000 tons. From this quantity of nitrogen 4,900,000 tons of ammonium sulphate could be produced, assuming a recovery efficiency of 70 per cent, which would represent a total value of about $200,000,000, depending on the market price."

G. B. Saunders, a Winnipeg coal merchant, dealing with "The Problem of Replacing Foreign Coals on the Manitoba Market," strongly boosted Canadian coal, asserting that Canada should be entirely independent of American supplies. That the Canadian mines are doing better business was obvious from figures; in Manitoba alone, he declared, fully 75 per cent of the domestic coal used this winter was from Canadian mines. The Western dealer was particularly bitter toward the attitude of some of the leading institutions in the country who, with their preference for American fuel, ignored the home product.

That the American coal business was operated on ruthless lines in order to retain the Canadian market was stressed by Mr. Saunders, who spoke of price cutting by importers of American coal and dealers in order to defeat the Canadian sellers. Many of the assertions about the superiority of American over Canadian coal were fallacious, he declared, instancing several tests that have been made with the two fuels in which the Canadian product made the better showing.

Spontaneous Combustion of Stored Coal And the Conditions That Favor It

THAT the tendency of coals to fire spontaneously differs with their age, the younger coals being the most dangerous, is one of the conclusions of Joseph D. Davies, fuel chemist of the U. S. Bureau of Mines, and John F. Byrne, research chemist of the Carnegie Institute of Technology, as expressed in a bulletin published as the result of experiments and inquiries cooperatively conducted by these two institutions. No case, say they, has been recorded in which anthracite fired spontaneously; even fines and slack can be safely stored. At the other extreme is lignite, which cannot be stored, even in lumps, with safety, except under water. Between these two extremes are the various grades of bituminous coals, the class most commonly stored.

The liability of different bituminous coals to fire varies widely on account of differences in the coal; but, broadly speaking, the bituminous coals of the eastern part of the United States store better than the coals of the Middle West. These, in turn, are safer to store than the sub-bituminous coals of the Intermountain region. Though the tendency to fire will vary widely in any one class of coal, generally speaking, the higher the rank the less the danger of fire and the less the deterioration in storage. The classification as to self-heating coincides with the classification of coals, beginning with lignite as the most dangerous, ranging through sub-bituminous, bituminous, semi-bituminous, to anthracite, which is the least prone to spontaneous combustion.

The solution of the problem of spontaneous combustion may lie in the microscopic examination of coals and its correlation with the rate of heating. Coal is composed of three parts, namely, anthraxylon, or bright coal; attritus, or dull coal, and mineral charcoal, and may be separated into almost pure samples of each. These three constituents differ in their ease of oxidation and rate of heating. Tests indicate that in the spontaneous heating of coal the anthraxylon is the constituent that first rises in temperature.

As the results of the experiments of Messrs. Davis and Byrne it is stated that the presence of fines in a coal pile should be avoided. Coal should be handled as little as possible and should be screened wherever practicable before storing. Coal coarser than ¼ in. showed no rapid self-heating throughout the experiments.

The experiments show that with the same coal, moist air will give a lower "critical" or spontaneous combustion temperature than dry air. Therefore, wetting the coal pile to retard heating is not good practice unless the coal is completely immersed.

Instead of hastening spontaneous combustion, partly oxidized coal seems to act as a deterrent when mixed with fresh coal. It appears that the danger in mixing two grades of coal, or in storing coal on the same pile at different times, arises from physical rather than chemical causes. If no heating has occurred at the surface of the heap, it is safe to pile more coal on top, provided there is no accumulation of fines at the contact of the new and old coal. A mixture of two kinds of coal will heat more rapidly than either one of them.

Artificial mixtures of coal and pyrite in various proportions showed a critical temperature no lower than that of the coal alone, whereas pure pyrites had a critical temperature 26 deg. C. higher than the coal. From this it appears that massive pyrite or "brass lumps" are not dangerous in a coal pile.

Better Isolated from Air than Ventilated

On account of the low conductivity of coal, cooling by artificial ventilation is almost impossible unless the air reaches every part of the pile. Generally the air travels through the stack in currents and exerts no cooling effects on parts a short distance away from its channels. It is easier to exclude air so completely as to retard oxidation than to ventilate the pile so thoroughly that the heat developed will be dissipated.

Coals have been tested under various physical and chemical conditions to determine the temperature at which they generate heat so rapidly that, provided no deterrent is applied, the coal will eventually ignite. This temperature has been arbitrarily called the "critical temperature." Under similar conditions of heating and aërating, this critical temperature is an index of the liability of a coal to fire spontaneously. The "critical temperature" method of testing coal may be applied to the various coals of the country for grading their relative tendencies to fire spontaneously, and the U. S. Bureau of Mines expects to develop this method further and apply it in a survey of the coals of this country.

The results of these tests are summarized in Bulletin 3, Coal-Mining Investigations series, which is distributed by the Carnegie Institute of Technology, Pittsburgh, Pa., at a price of 25 cents.

Problems of Operating Men

Edited by James T. Beard

Room-and-Pillar Work in the Miller or "B" Seam

Knowledge of Conditions Needful—Soft Bottom, Characteristic of This Seam—Uniform Pillars Essential to Successful Work

REFERRING to the question asked by Robert Holt, *Coal Age*, Feb. 1, p. 226, as to whether it is better to delay the drawing back of pillars when a room has reached its limit, in the working of the Miller or "B" seam; or whether better results can be obtained by starting the work of robbing at once, allow me to submit the following:

My understanding is that the purpose of delay would be to permit all the rooms on a producing entry to reach the limit and then pull back the pillars in one continuous line. The inquirer further draws attention to the timbering being in good condition when the room reaches the limit, but fears the effect of the soft bottom, if the work of robbing is delayed.

My experience tells me that soft bottom is characteristic of the Miller seam, at least throughout the Somerset County field in Pennsylvania, which limits my acquaintance with this seam. In some instances, however, I have known the fireclay underlying the coal to be of such a composition that it will not disintegrate as rapidly as it does in other localities. A thin stratum of coal underlying the clay, in places, gives a greater firmness to the material and enables it to better resist the increasing pressure when the coal is taken out.

Development of Mine Is Invariably Accompanied by Squeeze

However, in every instance in my experience, a fairly extended development has been accompanied with a more or less pronounced squeeze. This fact has led me to conclude that it is always safe to anticipate the occurrence of a squeeze, in working this seam, and to adopt every precaution to reduce its effect to a minimum.

Assuming that the mine is worked advancing on the room-and-pillar system, as I believe is the case in this instance, the tendency to squeeze can be considerably reduced by the maintenance of uniform pillars throughout the mine, particularly the pillars between rooms. While this is easy to suggest and in strict conformity with the principles of good mining practice, its application is not so easy in the working of this particular seam.

Unfortunately, the Miller seam is characterized by numerous rolls, which make it absolutely necessary, at times, to narrow the width of the rooms, or even change their direction, in order to overcome this obstacle. In other words, it is difficult to always drive the rooms on sights, under the conditions that prevail in the Miller seam.

Let me suggest, here, that it is always advisable to adopt a uniform system of posting that will make it possible to maintain the prescribed width of the room and thickness of pillars. My experience has proved that such a regular system of posting distributes the roof pressure more uniformly and the posts will continue to support the roof a longer time without breaking, and there is less evidence of coming squeeze than when the timbers are set in a haphazard way.

A seam of this thickness, 3½ ft., will not develop a surface break, until a large area has been extracted, if it does then. Extracting pillars as the rooms are finished, will throw a great weight on the remaining room stumps as well as on the chain or barrier pillars, and a squeeze will be almost inevitable. If that occurs an unavoidable loss of coal will follow as many of the remaining stumps and pillars cannot be taken out with safety.

On the other hand, if the pillars be left until the roomwork is completed on an entry, the chances are more strongly in favor of an extended squeeze occurring very shortly after the work of drawing the pillars is commenced. Unless very wide pillars are left, there will be no solid coal of sufficient dimensions to cause a break that will relieve the pressure and avoid the squeeze that is imminent and certain to prove disastrous to the future working of the mine.

Choice Lies Between Two Evils

Out of two evils, therefore, we will choose the least. My judgment is that there is less danger to be anticipated, under these conditions, if the work of robbing the pillars is commenced at once when a room reaches its limit. It is always a judicious course, however, in a case like this where it is necessary to choose between two evils, to carefully explain the possibilities in each proposition. It should be understood, beforehand, that the method chosen will not eliminate loses that are sure to follow, in the working of the seam by reason of conditions that cannot be wholly overcome.

A study of these conditions that so generally prevail in the Miller or "B" seam, has shown to me that one thing liable to occur is the sudden breaking of the roof strata where it might be least expected: namely, in advance and isolated narrow work. Such has been my personal experience, on several occasions, and I have discussed the cause of these sudden breaks with a number of mining men.

Those with whom I have conferred have expressed themselves as believing that the cause of such breaks was either gas or water pressure, though neither of these were manifest, at the time of the occurrences or later, in sufficient volume to warrant this conclusion. It would be of interest to learn the thoughts of others regarding the cause of these sudden breaks, in driving advance headings in this seam.

I. C. Parfitt.

Washington, D. C.

Electric Cap Lamp in Firebossing

Lamp has no value for testing for gas—Bright light blinds the eyes—Requires too much time to screen light when making a test.

IT HAS been a surprise to me that so many of the writers in *Coal Age* have professed a preference for carrying an electric cap lamp on their heads when making their rounds as firebosses in mines. I heartily agree with O. G. Sharrer, whose letter appeared in the issue Nov. 30, p. 779, when he says: "Any official whose duties require him to test for gas in the mine should carry no other lamp than an approved testing lamp."

The electric lamp has no value for making a test for gas. It is my belief that should a fireboss carry such a lamp in his cap when making his early rounds in the morning it would prove a menace in more ways than one. It is well known that most firebosses have large districts to cover, which keeps them on a constant run.

Reasons Why Fire Bosses Should Not Carry Electric Cap Lamps

On account of the limited time for making the examination, the fireboss has no time to spare to hide his cap lamp when wanting to make a test. The bright glare of the electric lamp obscures his vision and he is unable to see the faint gas cap that may form in his safety. Many firebosses will take chances, under such conditions, and not make any effort to screen their electric lamps, which thus become a menace to safety.

Taking these things into consideration, I consider it both wrong and dangerous for any fireboss to carry an electric lamp in his cap when examining a mine for gas. He should have with him, in his morning examination, no other than an approved safety lamp. This conclusion is the result of a wide experience in firebossing, first in England and then in West Virginia mines.

As fireboss, I never used any other lamp than a safety lamp of approved type. In the examination for gas, I have always regarded an electric lamp as a menace to the safety of everyone employed in the mine.

In some mines where I have firebossed, it was necessary for me to shed my coat, vest and overshirt while making my run of the district in my charge. Even then my undershirt and trousers would be wet from the perspiration that poured from my body.

Bay City, Mich. WILLIAM DICKINSON.

Working Coal with Soft Bottom

Must guard against squeeze and creep—Two methods of working proposed—Retreating panel system—Narrow rooms with wide pillars—Longwall conveyor face.

WITHOUT a more intimate acquaintance with the situation, it is difficult to give an intelligent answer to the inquiry of Robert Holt, *Coal Age*, Feb. 1, p. 226, regarding the working of a coal seam having a soft bottom and a fairly strong roof, such as he describes in reference to the Miller or "B" seam, in Pennsylvania.

Experience teaches that the main things to guard against in the room-and-pillar method of working under the conditions described, is the occurrence of creep or squeeze. Creep is the result of leaving too small pillars for the support of the roof, in the first working, when either the roof or floor, or both, are soft and of a yielding nature.

As the work of extracting the coal proceeds, the pressure on the supporting pillars is increased in the ratio of the area being worked, to the area of the pillars that remain. If half the coal is taken out in the first working, the pressure on the remaining pillars is doubled and, as a consequence, they are forced into the soft bottom. The roof sags and the bottom heaves.

Difficult and Often Impossible to Stop Squeeze When Once Under Way

Mining men who have had these conditions to contend against know that when a squeeze is once started it is difficult to control. Timbers are broken and the pillar coal crushed, making it difficult or impossible to recover that coal with safety.

Following these general remarks, I have two propositions to present in respect to working a seam of coal under the conditions named. They are: 1. The adoption of a modified panel system on the retreating plan, employing the room-and-pillar method of working out the panel. 2. Arranging a conveyor face, say 500-ft. in length, in working out the panel.

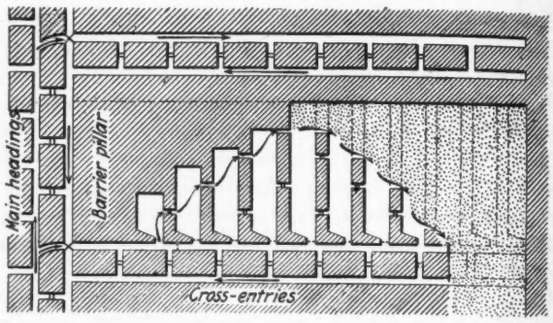


FIG. 1. ROOM-AND-PILLAR SYSTEM, PANEL METHOD

Describing Two Methods of Working a Panel

As shown in Fig. 1, the room entries are driven up to the boundary line of the panel, or a distance that will allow of driving, say thirty rooms in the panel. No rooms are turned, however, until the entries reach the boundary where the first rooms are started, the plan being to work out the panel on the retreating system.

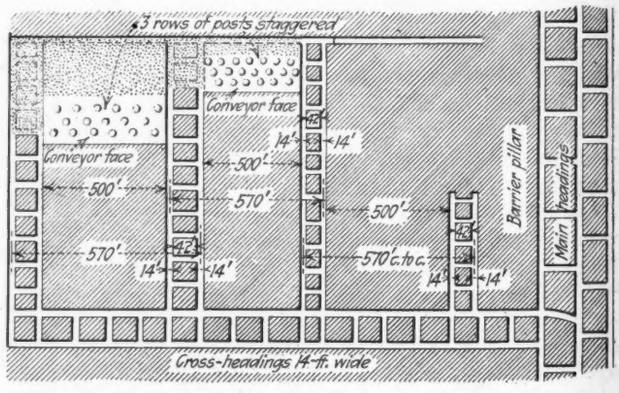


FIG. 2. LONGWALL CONVEYOR FACE, PANEL METHOD

As each room reaches the limit, the work of drawing back the pillar is begun at once. If the pillars are left to stand there will be danger of starting a squeeze, which would hinder the work and cause a loss of much coal. As each pillar is finished, the work of taking out

the entry pillars and stumps should follow immediately, care being taken to keep the line of pillar work uniform across rooms and entries.

In Fig. 2 is shown the method of working out the panel by establishing a longwall face, using a conveyor to transport the coal along the face. As before, the entries or headings are driven the length of the panel. At that point, two rooms are turned and driven up to the full depth of the panel, say from 60 to 75 yd., depending on the conditions in the roof and floor.

At the same time, two other rooms are started at a distance of 500-ft. outby. Like the first, these rooms are driven up to the limit of the panel. The two pairs of rooms are then connected by driving across the face of the coal.

When this connection has been made, a conveyor is installed and the entire block of coal between the two pairs of rooms worked back to the headings. As shown in the figure, while this is being done another pair of rooms is started and driven up to the limit of the panel, Here, a second longwall conveyor face is formed and worked back in the same manner as the first.

In closing, let me say that it is important to keep in mind that success in mining coal under the conditions mentioned, depends on driving narrow places with wide pillars and working back on the retreating system, whether the coal is worked out on the room-and-pillar system or by a longwall face. Every precaution must be taken to avoid starting a squeeze or creep. In no case, should the work of drawing back the pillars, as each room reaches its limit, be delayed. In my opinion, this would be particularly disastrous to the roads and timbers where the bottom is wet.

In adopting the longwall plan, the face of the coal can be worked out square with the panel, or on a diagonal line, as may best suit the conditions in the coal. In any case, the small pillars formed, in driving each pair of rooms when laying out the panels, should be brought back in line with the longwall face. Either of the plans proposed, will, in my judgment, require less narrow work and result in a larger extraction of coal than is possible otherwise, while at the same time making a squeeze less liable. W. DICKINSON.

Bay City, Mich.

Inquiries Of General Interest

Making a Test for Gas in a Room

Dispute with Reference to Being Able to Find a Few Inches of Gas at the Roof of a Room When the Layer of Gas Is Too Thin to Feed Into the Lamp

A FEW days ago I was an interested listener to an animated dispute between two men who bore reputations for being practical mining men, but who appeared to hold radically different views on a matter pertaining to the testing for gas in a room or chamber.

For the purpose of the argument, we will assume the coal seam was flat. The question in dispute had reference to a thin layer of gas at the roof of a room. It was assumed that the test was to be made with a bonneted Koehler lamp. One of the men claimed that, with this lamp, he could detect the presence of any gas at the roof, although it might be but a thin layer extending an inch or so below the roof.

Both men used the term "inches of gas," in its general acceptance in the practice of firebosses. Six inches of gas would mean that the lamp flame gave the first indication of the presence of gas at a point six inches below the roof line. The first man's theory was that the gas, even if but a thin layer was there, would naturally descend and enter the lamp and its presence would be manifest on the lamp flame.

The second man claimed, on the other hand, that the gas being lighter than air would not naturally flow down and feed into the lamp, as such action would be contrary to physical law. He stated that unless the layer of gas was 9 in. in thickness, so that it would reach the ports where the air and gas fed into the lamp, a proper test could not be made that would show the presence of the gas.

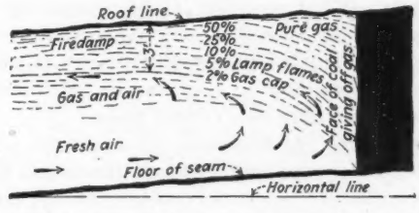
Judging from the conservation, both men appeared to understand the situation alike; but, while one claimed that the gas would descend from the roof far enough to feed into the ports of the lamp designed for the entrance of air, the other claimed that this would be contrary to the laws of nature, inasmuch as the gas was lighter than air.

The fact that these men are both regarded as authorities on such a question, leads me to ask the opinion of *Coal Age* regarding the question presented.

Pittsburg, Kan. AN ANXIOUS LISTENER.

While it is true that the lighter density of the gas gives it a tendency to ascend and causes it to follow the roof line as closely as possible, it is likewise true that there is taking place a constant diffusion of the gas into the air below. As has often been explained in the columns of *Coal Age*, this diffusion of the gas into the air makes it impossible to maintain a definite line of separation between the gas and the air.

Assuming a generally flat seam, gas that may issue from the face of the coal at the head of a room or



SHOWING MOVEMENT OF GAS AT WORKING FACE

chamber will rise and travel along the roof as a thin layer of gas. But, at the same time, diffusion is constantly taking place between the gas and the air, so that there is no marked line of division between the two. A common practice among firebosses is to report a certain number of inches of gas found at or near the face of a room. This method of reporting the gas, however, is only suggestive of the condition that actually exists in the room.

In order to make more clear the situation, we here repeat an illustration that has been shown in previous issues of *Coal Age*. The dotted lines shown in the figure make plain the movement of the gas from the

face in a generally upward and forward direction and the decreasing percentage of gas from the roof downward is likewise indicated.

In reply to the question in dispute, it can be said that it would be generally impossible to walk under a layer of gas in a room or chamber without disturbing the gas more or less and causing it to descend in the wake of the person as he moves toward the face of the chamber.

Assuming, however, a still quiet condition where there is no appreciable disturbance of the layer of gas, it would be hard to detect, say two or three inches of gas at the roof, using the Koehler lamp and holding it in an upright position. A common practice among firebosses is to blow gently toward the roof, which disturbs the gas and causes it to descend and enter the lamp.

Examination Questions Answered

Examinations Under the Mines Act, Alberta, June, 1922

(Selected Questions)

QUESTION—*The quantity of air entering a mine at the intake is* 150,000 *cu.ft. per min., at a temperature of* 40 *deg. F., barometer* 28 *in. The quantity leaving the return is* 178,000 *cu.ft. per min., at a temperature of* 70 *deg. F., barometer* 28 *in.; what is the percentage of gases in the return air?*

ANSWER—For the same barometric pressure, the volume of air and gas is proportional to the absolute temperature, which gives for the expanded volume of the air current, in this case, 150,000 (460 + 70) ÷ (460 + 40) = 150,000 (530/500) = 159,000 cu.ft. per min. In this case, the volume of gas given off in the mine is 178,000 — 159,000 = 19,000 cu.ft. per min. The percentage of gas present in the return current is, therefore, 100(19,000/178,000) = 10.7 per cent, nearly.

QUESTION—*What are the chief causes of accidents from blasting in mines where shotfiring is done and the mine is known to give off methane* (CH_4) *and where a considerable amount of coal dust is produced? What steps would you take to prevent them?*

ANSWER—The chief causes of accident in blasting coal, in mines generating gas and dust, are the failure to make and enforce strict rules and regulations regarding the kind and weight of powder used and the inspection, charging, tamping and firing of shots. The excessive use of powder or the mixing of different grades of powder in the same hole; the firing of two or more shots at the same time in a close place; shooting in the presence of gas or accumulations of dust at the working face; the misplacing of shots, or shooting coal off the solid and many other causes give rise to blownout shots and produce local explosions of gas and dust that are dangerous.

Under the conditions named a maximum degree of safety is derived by the employment of shotfirers who shall examine charge and fire all shots drilled by the miners, after the men have left the mine for the day.

Shotfirers should be authorized to refuse to fire any shots that, in their judgment, are unsafe.

QUESTION—*What are the causes of the production of coal dust in mines, and what steps would you take to reduce it as much as possible?*

ANSWER—The production of fine coal dust is most serious in the mining of coal by machines. Large quantities of fine dust are also produced by the excessive use of powder, in blasting a soft friable coal. In the mining of coal by machines, the fine cuttings or "bug dust," as it is called, should be carefully loaded and taken out of the mine in dust-proof cars. No accumulations of these cuttings should be allowed at the working face and they should not be thrown back in the gob.

In respect to blasting a soft friable coal extra care must be used in the placing of the shots and the charging of the holes. All holes should be examined by competent men appointed for that purpose, before the holes are charged or fired. Strict regulations should be enforced and violations of the rules promptly punished.

QUESTION—*What are the chief dangers of coal dust and what steps would you take to counteract them?*

ANSWER—The danger arising from the presence of dust in mines is dependent on the fineness and inflammability of the dust and the manner in which the dust question is handled. The danger is imminent where dust is allowed to accumulate, in quantity, on the roads and timbers of all air-courses, travelingways and working places. Also, when all needed precautions are not taken to prevent the suspension of the dust in the mine air, by humidifying the mine by steam introduced into the intake current, or by spraying or watering the roads and working places. The methods employed in the working of the seam and the mining of the coal are largely responsible for the degree of danger from dust.

QUESTION—*Explain the difference between a force fan and an exhaust fan.*

ANSWER—As far as the fan itself is concerned there is no difference in its action. The revolution of the fan blades develops a centrifugal force by reason of the weight of air revolved within the fan. As a result air is drawn in at the center and discharged at the circumference of the fan. The difference between these two types of fans consists solely in the manner in which the fan is connected with the mine to be ventilated. In a blowing fan the circumference of the fan is connected directly with the fan drift, while the central orifice of the fan is open to the atmosphere. This arrangement permits the air to be drawn in to the fan and discharged into the fan drift by which it is conducted through the mine under the pressure due to the action of the fan.

On the other hand, when the fan is exhausting the central orifice of the fan is connected by a suitable casing with the fan drift, while the circumference of the fan opens into an expanding chimney leading to the atmosphere. By this arrangement the mine air is drawn into the fan and discharged at its circumference into the chimney by which it is thrown into the atmosphere at a low velocity.

In each case the fan acts to produce a depression at its center and a compression of the air at its circumference. When blowing air into the mine the latter is ventilated under a pressure above that of the atmosphere, this pressure being created by the fan is always determined or caused by the mine resistance. When exhausting air from the mine the latter is ventilated under a pressure below that of the atmosphere, the atmospheric pressure then forcing the air through the airways to relieve the depression caused by the fan.

Daily Output of Basic Commodities Higher in February; Retail Sales Keep Pace; Wholesale Price Index Up

Productive activity was maintained in February at the high levels reached during the previous month, according to early figures received by the Department of Commerce through the Bureau of the Census. In many cases declines are shown owing to the smaller number of working days, but when allowance is made for this factor, the rate of production in most of the important basic commodities was slightly larger than in January.

Daily rate of consumption of cotton and of production of fine cotton goods, pig iron, lumber and automobiles exceeded the January rate. In most lines connected with railroad equipment and building, such as locomotives, pig iron, fabricated structural steel, building contracts and oak flooring, the actual February sales were still greater than January orders.

Retail sales kept up to January's mark in spite of the shorter month, while the transportation system showed signs of overcrowding in the large car loadings and increased shortage of freight cars. The wholesale price index advanced one point, and again the decline in coal prices prevented a further rise. Food prices, both at wholesale and retail, declined. Increased prosperity is confirmed by the marked decline in business failures and the continued rise in stock prices.

In the textile field, the increasing rate of cotton consumption reduced total stocks of raw cotton at the end of February to the lowest point reported at this season of the year since 1914. Wool receipts, with one exception, were higher in February than in any month since April, 1921, while silk consumption, also with one exception, was the largest since 1919.

Pig-iron production in February was at a slightly higher rate per day than in January, while steel-ingot production was slightly less. Unfilled orders of the United States Steel Corporation increased to 7,283,989 tons, the highest since January, 1921. Unfilled orders for locomotives made a new high record in February, fabricated structural-steel sales were the highest since last May but orders for steel castings declined.

Production of bituminous coal declined in February to 42,160,000 tons from 50,123,000 tons in January.

Building contracts awarded in February amounted to 41,611,000 sq.ft., showing an increase over January in place of the expected seasonal decline. Shipments of building materials, such as lumber, flooring and cement, showed large increases over January and over February of last year.

A net shortage of 65,000 freight cars at the end of February was the first increase over the recent low point of 45,000 cars short at the end of January.

U. S. Steel Corporation Mines 23,293,471 Tons of Coal in 1922; Wages Fall

The mines of the United States Steel Corporation produced 23,293,471 tons of coal in 1922, as compared with 21,627,939 tons in 1921, an increase of 1,665,532 tons, or 7.7 per cent. Of the tonnage produced in 1922, 16,778,413 tons was used in the manufacture of coke and 6,515,058 tons for steam, gas and all other purposes, as compared with 14,546,103 tons used in the manufacture of coke and 7,081,836 tons used for gas, steam and all other purposes in 1921. Inventory as of Dec. 31, 1922, showed the value of coal, coke and other fuel on hand to be $10,807,030, as compared with $13,054,195 on the corresponding date of the previous year.

There was expended for improvement on the coal and coke properties of the corporation during the past year $5,987,117, of which $1,762,509 was for the acquisition of additional acreage of coking and gas coal in Greene County, Pennsylvania, and in the Illinois and Indiana coal fields. For surface land in Greene County, Pennsylvania, for a shaft and town site at the Dilworth works and for a railroad right of way $171,367 was expended. In the Connellsville district $469,313 was expended for tenement houses and $1,343,828 for facilities to increase the output of Colonial Nos. 1, 3 and 4 works and for underground transportation through Alice Mine to Colonial Dock.

In the West Virginia and Kentucky fields $198,931 was expended for bridges, roads, tenement houses and general construction at works Nos. 30 and 31. On the construction of two new coal-mining plants in Washington County, Pennsylvania, $891,089 was spent.

The corporation had on its payrolls of the coal and coke properties on Dec. 31, 1922, 26,856 persons, an increase of 4,405 over the previous year. Its entire payroll numbers 214,931, as compared with 191,700 in 1921, while the total salaries and wages paid was $322,678,130, as compared with $332,887,505 in 1921, a decrease of $10,209,375. The average earnings per employee per day, including general administrative and selling forces, for 1922 was $4.91 as compared with $5.73 in the previous year, while the average earnings per employee per day in December, 1922, was $5.59 as compard with $4.60 in the corresponding month of 1921.

On Sept. 1, 1922, an increase of about 20 per cent was made in the pay of common labor of the subsidiary companies other than those of the railway companies, the rates for other classes of employees being advanced equitably.

The annual report says that in western Pennsylvania $2,302,503, including the expenditures in Greene County, was spent for opening and developing new coal properties and that further disbursement for the same purposes will be made this year.

Pensions paid to retired employees amounted to $1,266,661 compared with $947,879 disbursed in the preceding year. At the close of the year there were 3,886 names on the pension rolls, a net increase of 449 during the year. Since the inauguration of the pension plan in 1911 an aggregate of $8,095,122 has been paid in pensions. For accident relief $4,170,945 was expended, including accruals not yet actually payable under state compensation laws, compared with $4,409,211 in 1921.

The subsidiary companies of the corporation advanced or lent employees on contracts and mortgages $8,143,005, carrying interest at 5 per cent and payable in installments over a period of years to assist them in acquiring homes under the corporation's home-owning plan. In providing modern sanitary facilities for employees $2,252,975 was spent.

The coal properties owned or leased include 419,286 acres vein area of coking coal, 343,384 acres vein area of steam and gas coal, and 303,097 acres of surface. The corporation has 61 coking plants with 18,532 beehive ovens and 2,992 byproduct ovens. There are 62 coal-mining plants not connected with coke plants and nine coal-washing plants.

The corporation's water-supply plants in the Connellsville coke region have a daily capacity of 18,000,000 gallons, and in addition to furnishing the water necessary in manufacturing coke, serve water to three municipalities.

JOBBERS AND DEALERS in Columbus, Ohio, are discussing a circular letter recently received from the Central Fuel Co., of Cincinnati, which represents the Ford coal-producing company. Among other things in the circular are: "The first and last quotations for March for 1-in. shaker, boom-loaded lump, $4.25. Due to a better car supply and decreased costs we are lowering prices from $4.75 to $4.25. Dealers will always get the benefit of Ford's organization and at a fair price. Good coal for good people at a fair price." Attention is called to the published statement from Henry Ford that when he was asked $4 per ton for coal he closed down his Highland Park plant, contending that the price was too high.

Ford Raises Wages in Pond Creek Mines

A new scale of wages was announced March 20 by the Ford interests, which recently obtained control of the mines of the Pond Creek Coal Co. The new rates are retroactive to March 1. The minimum wage for outside labor is now 75c. an hour. A rate of 95c. an hour has been fixed for skilled inside labor such as that performed by assistant foremen. The rate for motormen, bratticemen, tracklayers, wiremen, pumpers and drivers is now 90c. an hour. Brakemen will be paid at the rate of 85c. an hour. Common unskilled inside labor will be paid 80c. an hour.

An increase also has been announced in the mining rate. Cutters' pay has been increased from 31 to 34c., shooting from 23 to 24c. and loading from $1.15 to $1.20 per car. It also is stated that just as soon as scales can be installed all coal will be weighed. In other words, miners will be paid by the ton instead of by the car. It is stated by officials, however, that the scale weights will figure out about the same as the rate per car for loaders.

It also is announced that in the commissaries of the company all goods will be sold at actual cost, in addition to handling charges. Many articles were already being sold at cost, it is stated.

Interesting Data in Annual Report of West Virginia Department of Mines

There were 888 firms in West Virginia controlling 1,381 producing coal mines, exclusive of small country banks and wagon mines, reporting a total production for the fiscal year of 70,888,203 gross tons, a decrease of 9,873,401 gross tons or 12 per cent, compared with the previous fiscal year, according to the annual report of the State Department of Mines for the twelve months ending June 30, 1922. Coke manufactured was 175,156 net tons, a decrease of 661,572 net tons, or 79 per cent.

The department computes the estimated value of the production of both coal and coke for the fiscal year ending June 30, 1922, to have been as follows.

	Value	Gross Tons
Used at mine for steam and heat	$2,019,362.85	791,907
Sold to local trade and tenants	3,343,004.10	1,310,982
Used in coke ovens at the mines	755,185.05	296,151
Shipped	172,862,365.65	67,789,163
Mined by small country mines	1,785,000.00	700,000
Total produced	$180,764,917.65	70,888,203
Total coal sold	177,990,369.75	69,800,145
Coke sold	1,026,414.16	175,156

PRODUCTION OF COAL IN WEST VIRGINIA, FISCAL YEARS ENDED JUNE 30

(In Gross Tons)

District	1922	1921	Increase	Decrease
Panhandle	3,796,904	4,079,344	.....	282,440
Fairmont	9,625,112	14,666,409	.....	5,041,297
Preston, Barbour	3,066,657	4,917,955	.....	1,851,298
Elk Garden	1,080,042	2,453,986	.....	1,373,944
Mason	48,253	242,480	.....	194,227
Putnam	170,552	260,102	.....	89,550
Kanawha	6,110,150	10,237,876	.....	4,127,726
New River	11,900,162	13,740,070	.....	1,839,908
Logan	13,904,980	10,861,391	3,043,589	.....
Pocahontas	18,354,975	17,449,819	905,156	.....
Mingo	2,130,416	1,152,172	978,244	.....
	70,888,203	80,761,604	.....	9,873,401

It is reported that 3,434 mining machines were in use at 1,028 mines employing 44,070 men and producing 54,459,527 gross tons of coal, which represents 76.8 per cent of the production of the state. In 1897 there were only 16 mines using 55 mining machines and machine-mined coal represented but 5.12 per cent of the production. In 1897 there were 10,971,482 tons of coal produced by the pick-mining method at commercial mines and 13,218 pick miners were employed. In 1922 15,728,676 tons of coal was mined at pick mines. It is estimated that 8,795 acres of coal was mined out and that since 1897 the total acreage exhausted has been 180,227.

The average price received by pick miners throughout the state for run-of-mine coal was 95c., the same as in 1921. The average tonnage produced by each pick miner was 1,111. The average annual wage of pick miners (all pick miners included) was $1,055.45, which was $110.20 less than that of 1921. The average selling price of coal shipped from the mines of the state was $2.55 per gross ton, run of mine, a decrease of $2.10 per ton from the price received the year before. Coke was sold f.o.b. at the ovens during the year at an average price of $5.86 per net ton, which was a decrease from the previous year of $3.72 per ton.

Ford Acquires 120,000 Acres More of Coal Land in Kentucky

Henry Ford purchased 120,000 acres of undeveloped coal land in Kentucky early last week, according to an announcement March 23 from the offices of the Ford Motor Co., Detroit. The property, purchased from the F. S. Peabody interests, of Chicago, is in Bell, Clay, Harlan, Perry and Leslie counties. The purchase price was said to be between $3,000,000 and $4,000,000.

Through his latest purchase Mr. Ford comes into possession of a tract of virgin coal lands with a reserve coal supply of 500,000,000 tons, making 165,000 acres of such land owned by the manufacturer.

From these holdings Mr. Ford hopes that within a year will come sufficient coal to supply all his factories in every part of the country, all factories and mills manufacturing various products for his own concerns, as many of the industries in this district as care to buy coal from him, and have left fuel sufficient to supply a part of the domestic demand of the country.

Mr. Ford, it was announced, will ask all industrial users of his coal to install furnaces that will remove only the gas and similar substances, leaving a fuel unimpaired for domestic purposes. The coal, after this process, would be sold to heat the homes of hundreds of thousands of workers throughout the country. The fuel remaining after the gas had been taken out would be even more valuable for home heating purposes than it was before, it was explained.

The Ford plan will be to supply his own industries first, then the industries of companies that supply the Ford concern with parts or materials, then other companies operating in the Detroit region and lastly the domestic consumer, or home owner.

Mr. Ford, it was explained, recognizes the importance of furnishing coal to the domestic user and in keeping prices for this grade of fuel at a uniform level, but believes that the needs of industry should be met first.

AN ADVISORY COMMITTEE to work with the Federal Fuel Distributor on the matter of co-operative selling of coal has been named by Mr. Wadleigh as follows: George W. Reed, vice-president, Peabody Coal Co.; T. F. Farrell, vice-president, Pocahontas Fuel Co., New York City; W. D. Ord, president, Empire Coal & Coke Co., Landgraff, W. Va.; E. M. Poston, president, N. Y. Coal Co., Columbus, Ohio; F. W. Wilshire, vice-president, Consolidated Coal Co., New York; C. E. Tuttle, president, Tuttle Coal Corporation, New York City; C. E. Bockus, president, Clinchfield Coal Corporation; S. P. Hutchinson, president, Westmoreland Coal Co., Philadelphia; S. L. Yerkes, vice-president, Grider Coal Sales Agency, Brimingham, Ala.; W. M. Puckett, president, Corbin Creek Consolidated Coal Co., Charleston, W. Va.; S. A. Scott, New River Co., McDonald, W. Va.; J. H. Woods, general manager of sales, Pittsburgh Coal Co., and E. L. Douglas, vice-president, First Creek Mining Co., Cincinnati.

ASSEMBLYMAN ESMOND INTRODUCED A BILL (Assembly Print No. 1,841) in the New York State Legislature on March 22 which adds a new section 92 to the General Municipal Law authorizing cities and villages to buy coal and sell it to its citizens.

A MEASURE BY ASSEMBLYMAN VAN WAGENEN (Assembly Print No. 1,855) extends the provisions of the application of Section 78 of the Railroad Law, relative to coal jimmies and caboose cars to July 1, 1924.

National Coal Association Flays Union for Condoning Such Bloody Crimes as Herrin Massacre

In a statement issued last week the National Coal Association flays the United Mine Workers for "condoning" the Herrin massacre and other crimes, closing with this pointed sentence: "Has your union done anything whatsoever in the Herrin case other than to exert all its power and influence to obtain acquittal of every single person indicted?" The statement was a reply to Ellis Searles, editor of the *Mine Workers Journal* and official press agent for the union, who denied he ever had condoned the Herrin massacre.

The association, in its letter to Searles following his denial, says: "It is, after all, of small consequence what your personal views are in this matter. The attitude and conduct of the United Mine Workers, whose publicist you have been, is, however, of the greatest consequence."

The association quotes a local paper of the solidly unionized Williamson County (Illinois) mining field, where the Herrin massacre of June 22, 1922, took place. The paper, in reporting something of the notorious event, in which 22 non-union men were cut and shot to death by a mob after they had surrendered in their besieged strip mine, said this in a style reflecting the public opinion of unionized "bloody Williamson":

> At daybreak the 3,000 armed citizens (surrounding the mine) realizing that the future peace of their county was at stake, formed what has been termed by many one of the neatest columns of troops ever seen in the vicinity, worked their way into the stronghold of the outlaws and captured those that remained alive. Several of those that were taken from the pit alive were taken to the woods near Herrin, where later they were found dead and dying. There were no riots, merely the citizens of the county acting in the only way left them for the safety of their homes. The faces of the men who were killed in the disturbance are horrible sights. Uncouth, as all crooks must be at the beginning, they were doubly unattractive as seen after justice had triumphed and the county had again resumed its normal peacetime behavior.

Proceeding, the association, in excoriating the United Mine Workers, says to Mr. Searles:

"What are the vital elements of this Herrin massacre?

"(1) There had been sedulously instilled into the members of your organization in Herrin the fixed determination that no person not a member of your union, or of a union affiliated with it, should be permitted to mine a ton of coal in Illinois.

"(2) The members of your organization felt themselves a super government authorized and empowered to enforce this denial of the right of any other man to work.

"(3) This super government in the execution of its 'justice,' before bringing the power of its hand and the force of its law to bear, careful in the observance of its own rules, had its district leader Sneed telegraph to its head, your associate, John L. Lewis, to pass on the question whether the workers in the Herrin pit as members of the shovelmen's union were or were not within the ban of this super government as strike breakers.

"(4) Immediately prior to the tragedy your associate, John L. Lewis, International president, telegraphed the fatal words that these men were 'common strike breakers.'

"(5) Your associates in the local organization proceeded in organized, deliberate fashion to accomplish the act of 'justice' upon men who broke its law by working without the sanction of the United Mine Workers of America.

"(6) Since the time the deed was done and the mutilated and insulted bodies of the dead disposed of there has not, as you know, come a single sign of repentance or remorse from your associates in your organization in Herrin. Instead, those who were accused of participation in and responsibility for the occurrence of this execution have been honored. Open satisfaction has been manifested at the vindication of the higher law that no man may work without the permission of your organization. The effort of the state to punish the more immediate participants has been fought by your organization with all its power and might.

"How many of these elements of the Herrin massacre, which are the vital elements to the American people, has your organization, and your paper, as its mouthpiece, denounced?

"Was it such a denunciation to publish in the *United Mine Workers Journal* for July 1, 1922, without a word of disapproval, the statements of Subdistrict President Sneed and District Board Member Willis, in which they sought to shift the responsibility from the murderers to the company which had the temerity to seek to mine coal with members of what Lewis telegraphed Sneed could be treated as 'an outlaw organization,' whose members were to be viewed in the same light as 'any other common strike breakers'? Was it in the interests of law and order for Lewis at that critical moment to send a telegram which carried the word from the highest officer of this super government that these workers of the steam shovelmen's union were under the ban, with all the dread consequences that naturally followed that decision?

"Whenever a strike occurs in territory organized by the United Mine Workers, or in any territory which they are attempting to organize, any miner not a member of the United Mine Workers of America works in a mine under peril of violence. This denial of the right to work is the spirit which flamed up at Herrin.

British Miners Organize as at Herrin

"You doubtless recall an article published conspicuously in the *United Mine Workers Journal* of Feb. 15, 1923, with the following editorial note: 'This article was written by a British miner and tells in a graphic way how the union miners of three districts broke up a nest of "blacklegs" (as British non-unionists are called) who were producing coal while the union men were on strike.' Was it a denunciation of the spirit of Herrin to publish this article describing with evident relish an incipient Herrin in England, where the mine workers organized, as in Herrin, to prevent non-union men from working an outcrop mine, drove them from their work by force and intimidation and committed sabotage and theft?

"To what policy are we to ascribe the fact that in the columns of the *United Mine Workers Journal* we find no mention whatever of the acts of three locals of the United Mine Workers at Cliftonville, W. Va., one month after the Herrin massacre and in emulation of it, in organizing, marching upon and attacking with armed force the Cliftonville mine, where non-union men were employed, this attack resulting in the murder of the sheriff who was attempting to preserve for those workers their right to work? For this conspiracy forty-three members and officers of your union, including Jake Andes, temporary president of Local 1355; Harry Kuhns, secretary of the same local; Antone Salenski, president of the Donahue Local, and Louis Albert, president of the Cedar Grove Local, all at Avella, Pa., have been indicted and either pleaded guilty or were convicted after trial, and sentenced to prison terms. Was it in denunciation of the spirit of Herrin, and was it to promote the interests of law and order and to bring evildoers to justice that your union conducted the defense of these men?

"To what policy are we to ascribe the fact that in the columns of the *United Mine Workers Journal* we find no condemnation whatever of the series of outrages at the Willis Branch mine at Willis Branch, W. Va.? In that case, you will recall, the owner of the mine was willing to employ members of the United Mine Workers of America, pay the union scale of wages and apply the check-off to their pay, but refused to close his mine to non-union workers and to order their pay to be checked off. For this refusal the mine was put under the ban of your organization. It was attacked again and again by armed forces, the workers' community shot up, the stone power house blown up, the headhouse burned, the superintendent's house dynamited, the hoist machinery destroyed, and the tipple burned.

"As a result of these acts of warfare, where the issue was not one of wages, not one of working conditions, not one of whether the members of your organization should be employed, but solely a question of the right to work by miners

not members of your organization, Walter Romine, secretary of your local union, and George Barrett, your international organizer, among others, were tried, convicted and sent to the penitentiary, and David Robb, the financial agent of the union, became a fugitive from justice. Your organization has acknowledged responsibility, after suit, by settling for the damage done.

"And again, to what policy are we to ascribe the silence of the *United Mine Workers Journal* as to innumerable other acts of intimidation and violence the country over which have accompanied attempts to work mines with non-union men in territory organized or attempted to be organized by the United Mine Workers?

"We note in the issue of the *United Mine Workers Journal* of July 1, 1922, describing the details of the Herrin massacre, the following statement: 'The taking of human life through lawless acts cannot and must not be condoned or excused.' But we fail to find therein a single word of denunciation of the organized effort to intimidate those men who were engaged in their right to work. I hope that this editorial was intended to convey something more than a mere regret 'that one of the neatest columns of troops' had committed acts so dastardly as to arouse the public conscience against the principle which the United Mine Workers of America have labored incessantly to enforce, *viz.*, that no man shall work in the mines of the United States who is not a member of their organization.

"Webster in his definition of condone says 'to pardon or forgive, especially *tacitly, by treating the offender as if the offense had not been committed.*' In what way has the United Mine Workers of America treated the local organization in Herrin or its members since the Herrin massacre, other than as if the offense had not been committed? What has the union ever done to discipline this local organization? What has the organization done to assist the Attorney General and authorities of the State of Illinois to bring to justice the men who committed the murders which you denounce? In a mining community completely dominated by your union has it made for justice to have the United Mine Workers put the whole weight of its organization behind the defense of every person indicted? Has your union, in short, done anything whatsoever other than to exert all of its power and influence to obtain the acquittal of every single person indicted for the Herrin murders?"

Federated Engineering Societies to Make Survey of Coal Situation

Cincinnati, March 24.—Still another "careful and painstaking survey of the entire coal situation and especially as it is related to the recent shortage," was started under way at the meeting of the Executive Board of the American Engineering Council of the Federated American Engineering Societies which went into session yesterday at the Ohio Mechanics' Institute in this city.

The plan that was put forth and discussed at its opening meeting would provide for the co-ordination of the federated engineers, the Department of Commerce and the Coal Commission appointed by President Harding with all of the other groups and bodies that are interested in order to prevent duplication and avoid conflict.

During the discussion of this subject a letter from John Hays Hammond, chairman of the Coal Commission, was read and discussed. The prime point brought out in this was that the country at large should be aroused to the necessity of larger storage of domestic coal. The need of greater storage of coal for industrial purposes during the summer months to bring about advantages to the industries also was emphasized.

In drafting the resolution for the survey it was stated that its object would be "to determine the facts relating to engineering, economic and chemical factors involved and their influence upon the coal shortage at the mines and by large and small consumers."

Mortimer E. Cooley, president of the Federation and dean of the School of Engineering of the University of Michigan, was delegated to select the personnel of the committee and will announce their names later. He also will draft the line of procedure that will be followed. Twenty-nine units of the Federation and the Executive Board approved of the action taken and it was stated that $15,000 to $20,000 is available for the survey.

Some of the groups whose help will be enlisted in this work are bituminous and anthracite operators, representatives of the public utilities, equipment manufacturers and railroads.

Bids Submitted for 106,236 Tons of Coal For New York Municipal Departments

Bids for furnishing and delivering about 106,236 net tons of anthracite and bituminous coal to various city departments during the three months ending June 30, 1923, were received by the Board of Purchase of New York City on March 20. The fuel required includes 4,529 tons of screened soft coal, to replace domestic sizes of anthracite.

The specifications for screened soft coal call for the following analysis: Maximum moisture (per cent by weight as delivered), 3 per cent; maximum ash (per cent by weight dry coal), 6.5 per cent; minimum B.t.u. (per pound dry coal), 14,500; maximum volatile combustible matter (per cent by weight dry coal), 27 per cent; maximum sulphur (volatile per cent by weight dry coal), 2 per cent; minimum fusing point of ash, 2,550 deg. F.

The specifications for the semi-bituminous run of mine coal required called for the following analysis: Moisture, 3 per cent.; ash, 9 per cent for run of mine and lump, and 11 per cent for slack; B.t.u., 14,000 for run of mine and lump and 13,600 for slack; volatile combustible matter, 25 per cent; and volatile sulphur, not more than 2 per cent.

For furnishing and delivering 3,020 net tons of run-of-mine soft coal to the piers of the Department of Docks and the Fire Department the bidders were Burns Bros., $7.25, and F. M. A. Leach, $7.43, or at about $4.49 and $4.67 per net ton respectively at the mine.

Under Schedule "G," calling for barge deliveries, the bids on 36,980 tons of buckwheat No. 1 ranged from $5.49 (Steamship Fuel Corporation) to $6.80 (Gavin Rowe) per net ton delivered; on 3,000 tons of buckwheat No. 2, from $4.97 (Steamship Fuel Corporation) to $6.30 (Whitney & Kemmerer) per net ton delivered; on 12,900 net tons of buckwheat No. 3 from $3.26 (Steamship Fuel Corporation) to $4.93 (A. C. Gibson), and on 7,510 tons of soft coal from $5.49 to $7.50 delivered.

The prices submitted on buckwheat No. 1 were on a basis of about $3.17 per net ton at the mine; for buckwheat No. 2, at about $2.65; buckwheat No. 3 at about 94c. and for run of mine bituminous at about $4.75 if brought from central Pennsylvania.

For furnishing and delivering by truck to various points in Manhattan Borough 1,850 net tons of buckwheat No. 2 there were seven bidders ranging from $5.75 per ton by Martin F. Shea to $6.75 by two bidders, Blue Ridge Coal Corporation and Coal Traders, Inc. Three bids were received for furnishing and delivering 1,753 tons of screened soft coal. They were from Martin F. Shea, $11.75; Coal Traders, Inc., $11.50, and W. J. Howe & Co., $12.25. Martin F. Shea submitted a price of $5.37 for furnishing and delivering 3,000 tons of mixed coal (2,000 tons of buckwheat No. 3 and 1,000 tons of bituminous coal) while the Penn Fuel Co. submitted a price of $8.18. There were two other bidders.

There were three bids received for furnishing and delivering 1,433 tons of screened coal in Brooklyn, as follows: Wyoming Valley Coal Co., $7.79; Coal Traders, Inc., $11.50, and Commonwealth Fuel Co., $11.83.

For furnishing and delivering 1,300 tons of run-of-mine semi-bituminous coal to various points in the Borough of Queens the lowest bidder was the Titan Fuel Co. at $6.19 per ton, and the highest was the Wyoming Valley Coal Co., at $7.24.

Bids received for furnishing and delivering 1,800 tons of buckwheat No. 1 by barge and truck to designated points ranged from $6.62 by the Steamship Fuel Co. to $7.67 by Whitney & Kemmerer.

Coal Commission Enlists Services of Other Government Agencies in Investigation of the Industry

By Paul Wooton
Washington Correspondent of *Coal Age*

Evidence of insufficient resort to engineering advice impressed John Hays Hammond on his recent visit to the Alabama coal field. He is of the belief that the situation in Alabama is fairly typical of the entire coal industry. Certain companies, he says, make full use of the best available engineering talent, which, he observes, is one of the reasons for the needlessly wide spread between costs of production at different properties. Not only is the advice of coal-mining engineers needed but there is large opportunity in many coal mines, Mr. Hammond declares, for the profitable employment of mechanical engineers. Many of the problems under ground are mechanical, he pointed out.

In some of the Alabama mines, Mr. Hammond says, serious consideration should be given the relative economies which could be introduced by the improvement of underground haulage, by the sinking of more shafts and by the employment of more cutting machines. These improvements, he admits, involve large initial expense, but he believes they should be considered on the basis of ultimate economy. To save long hauls in metal mines, extra shafts frequently are sunk to great depth. While he realizes that a different problem is involved in coal mines, where the volume of the tonnage is so much greater, he points out that there is a corresponding advantage in that the depth of shafts usually is not great.

Sees Need for Better Engineering

Commissioner Smith also is impressed with the need for better engineering in many coal properties. In an address he delivered last year he discussed some engineering phases of the industry. "What engineering can do for the industry is already known," he said at that time, "for we have today large coal mines well laid out and equipped with modern machinery, which show in actual practice how we can better the business of mining coal. Our chief need in this business, as in some others, is merely to raise the average up to the best. Mines planned by engineers and managed by engineers, with the aid of the coal-consuming public, can come much nearer to giving the mine worker an actual opportunity to work eight hours a day and six days a week. Cheaper coal and larger earnings are two ideals which can be attained by engineering after bargaining has failed utterly. The reform of the coal business must be worked out mostly underground."

The commission, as a part of its efficiency policy, has made the largest possible use of government agencies already at work on the coal problem. The Federal Fuel Distributor, the Bureau of Mines, the Geological Survey, the Bureau of the Census, the Federal Trade Commission, the Interstate Commerce Commission and the Bureau of Internal Revenue all are co-operating to the end of making the commission's investigation accomplish the most good possible with the funds and time at its disposal. The latest development in this line of co-operation is the Public Health Service's assignment of sanitary engineers and physicians to assist in the study of prevailing sanitary conditions in mining towns. A group of these specialists left the first of the week for the field.

Chairman Hammond announced on March 24 that the commission is making a close study of the effects of relationships between the mining companies and the railroads in the anthracite region. He admitted that the commission had conferred with Assistant Attorney General Seymour with regard to the legal phases of the dissolution situation.

So that comparisons can be made of the mining laws of the United States with those of other countries, the International Labor office affiliated with the League of Nations is submitting data to the commission on the mining laws of Europe.

Colonel Edward O'Toole, of the United States Coal & Coke Co., conferred informally with the commission recently and told of conditions in the properties he developed in West Virginia and Kentucky.

Commissioner Wallace, of the Washington Coal Operators' Association, accompanied by Eugene McAuliffe, also conferred with members of the commission. A brief in behalf of the Washington Coal Operators' Association was filed. In it the peculiar position of the industry in the State of Washington is set forth. "A few years ago," says the brief, "all producers of coal within the state were members of the Washington Coal Operators' Association. Finding economic existence impossible under the conditions exacted by the mine workers' union, operators from time to time have withdrawn from the association, establishing a scale of wages below that exacted by the union until today but five producing coal companies remain as subscribers to the operators' association and to the joint wage scale last reaffirmed on Aug. 14, 1922. It is these five companies who still seek to maintain the principle of collective bargaining who now desire to present to the commission the situation which confronts them and the labor in their employ."

Photo Harris & Ewing

WAYNE P. ELLIS

Recently selected as secretary of the Northwest Coal Dock Operators' Association, Mr. Ellis is still serving on the staff of the U. S. Coal Commission as traffic expert.

Coal Commission Takes On Three Engineers

Three engineers have been added to the staff of the Coal Commission. They are Walter M. Dake, Jr., Ellery B. Gordon and H. M. Search. Mr. Dake was born in Nashville and educated at Vanderbilt University. He had extensive metal mining experience in Colorado, Nevada, California, Utah, Oregon, Wyoming and Lower California. For many years, however, he has devoted himself exclusively to executive and engineering work in connection with coal operations, most of which were in Western states.

Mr. Gordon formerly was secretary-manager of the Na-

tional Retail Coal Merchants' Association. During the war he was Assistant Fuel Administrator for the State of New York. During 1916 and 1917 he was with the Federal Trade Commission, having charge of the field work in the Buffalo and the Detroit areas. More recently he has been associated with E. W. Parker on the Anthracite Bureau of Information.

Mr. Search was graduated from Lehigh University in 1915, after having completed the course in civil engineering. He joined the technical staff of the Philadelphia & Reading Coal & Iron Co., where he was engaged until 1917, when he became assistant secretary of the Anthracite Coal Operators' Association. He served with the field artillery during the war. From 1919 to 1921 he was with the Weston Dodson Co. His last connection was with the Coal Service Corporation of New York.

Searles Denies Miners Would Take Wage Cut If Assigned Car Was Abolished

That the United Mine Workers of America will not accept any reduction in the present scale of wages is declared in a letter dated March 21 to the Interstate Commerce Commission signed by Ellis Searles in which he styles himself representative of the International Union. This letter was called forth by a statement on March 2 by J. J. Kintner, an attorney for district 2, in an argument before the commission relative to the abolishing of the assigned car rule, in the course of which he gave the commission to understand that if the commission would abolish the assigned-car rule the bituminous coal miners of the country would be willing to accept a reduction of approximately 20 per cent in their wages.

"As the duly accredited representative of the International Union of the United Mine Workers of America," said Mr. Searles in the letter, "I am authorized and directed by Philip Murray, acting International President of the union, to submit to your honorable body the following statement:

"The International Union of the United Mine Workers of America denies and disavows the statement in question which was made by Attorney Kintner. The International Union was not and is not in any manner responsible for said statement being made to the commission. The International Union here and now declares that it has no purpose or inclination to accept for the coal-mine workers of this country any reduction in wages, neither on account of the assigned-car rule nor any other reason. Any statement to the contrary that is made by any other person must be taken and understood as being an assumption that is not justified nor warranted by the policy of the International Union."

In face of statistics that indicate that the average earnings of miners last year was $700, Mr. Searles said, "it is astounding that any person should even suggest a reduction."

International Railway Fuel Association to Hear Kruttschnitt and Maher

Julius Kruttschnitt, chairman of the executive committee of the Southern Pacific Railroad Co., will deliver the opening address at the convention of the International Railway Fuel Association, at the Hotel Winton, Cleveland, on May 21-24. An address also will be made by T. K. Maher, president of the Maher Collieries Co.

A partial list of the papers to be presented is as follows: "Extension of Locomotive Runs," by C. B. Peck, associate editor, *Railway Age;* "Considerations Covering Use of Oil as a Locomotive Fuel," by M. C. M. Hatch, mechanical engineer, M. K. & T.; "Fuel Saving Aspect of Boiler Water Treatment," by C. R. Knowles, superintendent water service, Illinois Central; "Value of Individual Fuel Performance Records," by L. G. Plant, associate editor *Railway Review;* "Standardization of the Coal Business," by George H. Cushing; "The Other 10 Per Cent," by R. S. Twogood, assistant engineer, Southern Pacific; "Economic Aspects of the Fuel Oil Situation," by C. E. Beecher, U. S. Bureau of Mines; "Economy in the Heating of Stations and Buildings," by Prof. R. W. Noland, Purdue University; "Incentives for Promoting Fuel Economy," by O. S. Beyer, Jr. There also will be a topical discussion of the paper on "The Effect of Tonnage Rating and Speed on Fuel Consumption," presented by J. E. Davenport at the 1922 convention.

Judge McClintic Enjoins Use of Check-Off For Unionization of Open-Shop Mines

Judge George W. McClintic, in the U. S. Court for the southern district of West Virginia, handed down an injunction on March 21 at Huntington under the terms of which twenty companies having an agreement with the union are restrained from paying over to the union any moneys collected through the "check-off." The effect of the decision will be to restrain the use of money derived from the "check-off" for the unionization of open-shop mines.

Judge McClintic's decision was made in connection with a suit instituted several months ago by the Carbon Fuel Co. and twenty-two other coal-mining companies in the Kanawha district against the international organization of the United Mine Workers, its officers and District 17, its officers and local unions, as well as against the Black Betsy Consolidated Coal Co. and twenty other firms or companies now paying the check-off in accordance with an agreement with the union.

One effect of the decision may be to prevent the consummation of a contract now being negotiated with the union covering the year beginning April 1, 1923.

The injunction also prohibits the international organization from sending any money into West Virginia to be used for the unionization of the plaintiff's mines and prohibits the international organization from interfering in any way with the production of coal or with the employees of the plaintiff.

The Black Betsey Consolidated Coal Co. and Edwin Marmet and the nineteen other codefendants are especially enjoined from paying any money to the union for unionization activities against the operations of the plaintiffs. The defendants also are enjoined from doing or causing to be done anything toward the calling or continuance of any strike.

In explaining the effect of the injunction, S. B. Avis, attorney for the plaintiffs, said that "the miner and the operator can get together, but any agreement they may reach cannot be used to force a third party, either miner or operator, to concur in the agreement."

The terms of injunctions granted last summer to the Anchor Coal Co., Dry Branch Coal Co., the Seng Creek Coal Co. and the Raleigh-Wyoming Coal Co. prohibiting trespass and the use of persuasion or violence on employees of the plaintiff are reiterated in the injunction just handed down. Judge McClintic holds that the miners' union is engaged in a conspiracy to restrain trade and production and that such a conspiracy violates the anti-trust laws.

The injunction suit has been pending since last September, when Judge McClintic granted a temporary restraining order which he later extended but allowed to expire before handing down a final decision.

Class 1 Railroads Consume 10,127,000 Tons Of Coal in December at $3.76 per Ton

Class 1 railroads consumed 10,127,000 net tons of coal during December, 1922, as charged to account 394. compared with 9,736,000 tons in November, 1921, according to a report of the Bureau of Statistics of the Interstate Commerce Commission covering 177 steam roads. During the twelve months of 1922 these roads consumed 95,919,000 tons as compared with 91,726,000 tons during 1921. The delivered cost per ton in December was $3.76 or 15c. above that for December, 1921. The per-ton cost for the year was $3.94 as compared with $4.10 during 1921.

Fuel-oil consumption continues to gain. During December 157,380,000 gallons were used, as compared with 126,665,000 gallons in December, 1921. The figures for the twelve months of 1922 and of 1921 were 1,564,872,000 and 1,426,975,000 gallons respectively.

Wages in Harlan Field Not to Be Reduced; Scale Renewed in Western Kentucky

Wages of coal miners in the Harlan field will not be reduced April 1, according to announcement made March 22 following a meeting of the Harlan County Coal Operators' Association. The contract between the miners and operators expires April 1, and it was reported that an effort would be made to reduce wages.

In a statement issued at the close of the meeting E. R. Clayton, secretary of the association, declared that "the coal operators appreciate the fact that the extreme car shortage has worked a hardship on the men as well as on the companies and for this reason they are not going to make any reduction."

The greater portion of the field is non-union, but the non-union sections are affected by the union in that wages usually are based on the rates provided for in the union contract.

The West Kentucky Coal Operators Association and District 19 (Kentucky) of the United Mine Workers of America also have come to a satisfactory agreement for renewal of the old wage scale, which has been in effect for two years. The new agreement starts April 1, for one year, carrying a renewal of the old contract throughout. The conference, which was held at Louisville, was harmonious in every respect.

Harry L. Gandy Named Executive Secretary Of National Coal Association

An executive secretary has been chosen by the National Coal Association in the person of Harry L. Gandy, formerly a Representative in Congress from South Dakota. Mr. Gandy's association with the coal industry dates from 1914, when, on entering Congress, he was made a member of the Public Lands Committee and assigned to a study of the coal-leasing portion of the General Public Land Leasing bill. Since his retirement from the House of Representatives he has been actively engaged in the preliminary financing and other arrangements for the opening of a large coal property in the Huntington canyon of Utah.

Mr. Gandy was born in Churbusco, Ind., in 1881. His higher education was obtained in the Tri-State College at Angola, Ind., from which he was graduated in 1901. Prior to his graduation he had taught school for several terms and followed that profession subsequent to his graduation. He then entered the newspaper field and conducted newspapers at LaGrange and Kendallville, Ind.

Mr. Gandy went to Rapid City, S. D., in 1907 as news editor of the *Daily Journal*. Later he became business manager of the Rapid City Printing Co. and editor of the *Rapid City Guide*. From Jan. 1, 1910, to Aug. 1, 1918, he owned the *Gazette* at Wasta, S. D. In 1910 he was appointed United States Commissioner for the district in which he lived. This post was an important one, due to the large volume of public-land business in that portion of the state. Later he was elected to the State Senate from Pennington County. He is the only Democrat elected from that county to serve in the State Senate either before or since. He served one term and declined renomination. In July, 1913, he was appointed receiver of public moneys in the U. S. Land Office at Rapid City. He served until March 4, 1915, in that capacity.

In 1914 Mr. Gandy was elected to the House of Representatives from the Third South Dakota district. He was re-elected in 1916 and 1918, but was carried down to defeat in the Republican landslide of 1920. Even then, however, he ran many thousands of votes ahead of the ticket. He is particularly proud of the fact that during his political experience there was no election in which he did not carry, by a large majority, his home precinct, city and county, each of which ordinarily is overwhelmingly Republican.

It was Mr. Gandy who held out most determinedly on the House Committee on Public Lands for the provisions in the Leasing Act which allow portions of the revenue derived from mineral leases to go to the state and to the reclamation fund.

Mr. Gandy operates a 2,500-acre grain and livestock ranch near Wasta.

Since leaving Congress Mr. Gandy has been associated with J. H. Mays, formerly a member of the Utah delegation in the House of Rrepresentatives, in arranging the financing of and other preliminaries preparatory to the opening of a large coal property in the Huntington canyon of Utah. The proposition, among other things, requires the financing

Photo Harris & Ewing

HARRY L. GANDY

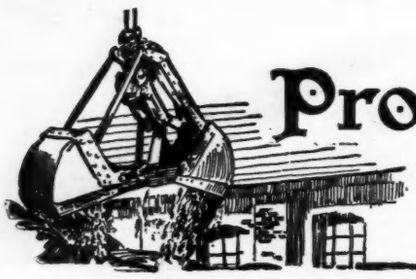
of a line of railway. In connection with these negotiations Mr. Gandy came in contact with a number of Eastern coal operators. The opening of his Utah coal operations must await the construction of the railroad, which led to his being asked to accept the executive secretaryship of the National Coal Association.

Brydon Favored for Presidency

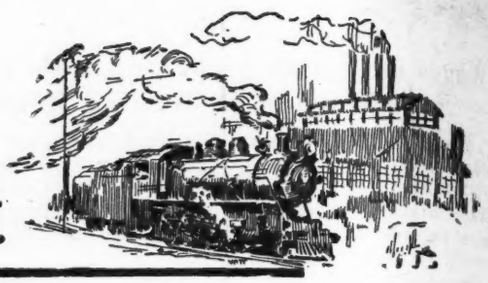
There are indications of widespread sentiment in the National Coal Association favoring the selection of John C. Brydon, of the Quemahoning Coal Co., of Somerset County, Pennsylvania, to be the president of the organization during the coming year. Were Alfred M. Ogle not inclined to insist on the continuance of the precedent established by J. G. Bradley—that presidents serve for one term only—it is certain that he would not be opposed. Since the prospects are that he will decline to be a candidate for re-election, many members of the organization, attracted to Mr. Brydon by his accomplishments as chairman of the special committee, will insist on pushing his candidacy.

Directors of the National Coal Association will meet in New York on April 11. In connection with that meeting, W. H. Cunningham, chairman of the convention committee, has asked his committee to meet to discuss the program for the annual meeting in June. The special committee of bituminous operators, of which J. C. Brydon, is chairman, will meet in New York on April 10.

Owing to its crowded docket and the short time remaining in the spring term the U. S. Supreme Court has notified the Federal Trade Commission that it will be unable to hear the Claire Furnace cost-reporting case before the fall term. The appeal from the Court of Appeals of the District of Columbia to the Supreme Court was granted March 17 and the commission sought permission to argue the case before the summer adjournment. The Court of Appeals on Jan. 2 sustained the injunction against the commission in the lower court.



Production and the Market



Weekly Review

The spot market on bituminous coal has sagged to a point where sales are extremely light. Spring weather and the beginnings of improvement in transportation have taken off the last edge in the East. The trade along the Atlantic coast misses the fairly steady inquiry that was current a month ago from retail dealers who were driven to find substitutes for anthracite. Manufacturers also who were then inclined to hedge against a possible upward swing in prices have now about ceased making their small purchases and are much disposed to await developments. There are shippers who figure a largely increased use of steam coal during the coming season based partly on better business generally and increased traffic.

Production was maintained at around the 11,000,000-ton mark while prices generally showed a decline. *Coal Age* Index of spot prices at the mines dropped to 246, a decline of 17 points from last week's figure of 263, with the average price at $2.98.

Heavy Demand for Coke for Export

The demand for coal for export quieted down considerably notwithstanding the conflicting reports of labor troubles in the British mines, which were largely discounted by New York houses with British connections. The short flurry because of exaggerated export demand had the temporary effect of increasing output, and there were accumulations at the Hampton Roads piers. Even contract tonnage moved rather slowly coastwise and it was only with difficulty that some shippers were able to arrange for disposition of their April coal. A demand for low-volatile coal for export is expected.

Coke continued in strong demand for export, with quotations firm at $12 to $12.50 f.o.b. piers. It was estimated that about 100,000 tons had been contracted for export, while steel companies were taking all they could get. Water freight rates were high, some owners, it was reported, quoting around $4 for April shipment to west Italy. The current rates to Hamburg range were $3.30 @ $3.50 for coal and around $5.50 for coke.

Dumpings at Hampton Roads for the week ended March 22 were 407,234 net tons, as compared with 344,052 net tons during the previous week.

There was a slight flurry in the Midwest due to a sudden but short-lived cold spell. While the larger industries are displaying little inclination to contract it is expected that considerably more tonnage than normal soon will be covered, principally because purchasing agents are fully awake to the danger of a car shortage during the summer and autumn months.

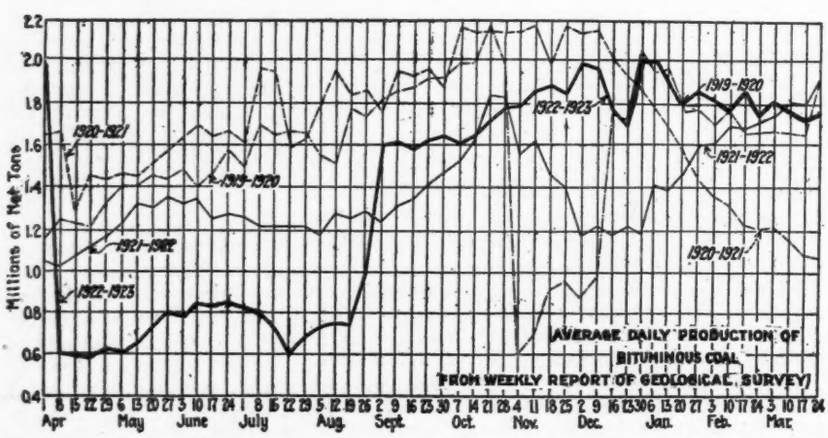
Better Car Supply at Gateway

From the Cincinnati gateway come reports of better car supply in eastern Kentucky and Logan County, West Virginia, simultaneous with a sharp drop in Eastern demand. Buyers large and small in the inland markets are marking time. The market on lump is gone and the prospects for steam coal after April 1 are dubious.

In New England most of the central Pennsylvania coals are a drug on the market. In a few cases the operators are disturbed over possible labor complications, especially in non-union sections, but the majority have been scaling down prices in the effort to enlarge their market.

"Present estimates of the soft-coal production for the week ended March 17," says the Geological Survey, "indicate a total output of 10,424,000 net tons, including coal shipped, mine fuel, local sales and coal coked. This is a decrease of approximately 200,000 tons as compared with the revised estimates for the week preceding.

"Preliminary reports of cars loaded in the week March 19-24 forecast another week's output at about



Estimates of Production

(Net Tons)

	1922	1923
BITUMINOUS		
Mar. 3	10,541,000	10,946,000
Mar. 10 (*b*)	11,102,000	10,627,000
Mar. 17 (*a*)	10,843,000	10,424,000
Daily average	1,807,000	1,737,000
Coal year to date	412,837,000	398,867,000
Daily average coal year	1,398,000	1,351,000
ANTHRACITE		
Mar. 3	1,913,000	2,104,000
Mar. 10	1,982,000	2,049,000
Mar. 17	1,907,000	2,057,000
Coal year to date	85,316,000	52,652,000
COKE		
Mar. 10 (*b*)	154,000	382,000
Mar. 17 (*a*)	149,000	409,000
Calendar year	1,443,000	3,953,000

(*a*) Subject to revision. (*b*) Revised from last report

10,500,000 tons. Loadings on Monday, March 19, were 39,215 cars and fell on Tuesday to 30,721 cars, and by Thursday had declined to 29,292 cars."

The anthracite situation has eased considerably. Demand is easier and retail dealers have no difficulty in taking care of current needs. Many have discontinued the purchase of independent coal unless they can get it at lower figures than prevailed last week.

Production of coke during the week ended March 17, as reported by the Geological Survey, was 409,000 net tons as compared with 280,530 tons during the previous week.

Demand Sharp in Chicago Flurry

A cold spell early last week brought a sharp but temporary demand for nearly all grades of coal in the Chicago market. Retail dealers showed some anxiety. Car numbers were in demand until the middle of the week, when the market became normal to weak on all steam sizes.

Railroad contract bids are higher in Indiana and West Virginia because of the awakening in export demand.

The situation for domestic coals was easy, but retail dealers everywhere in the midwest territory are slow to stock in spite of the recent reductions all along the line on prepared sizes. The fact that cars have been plentiful throughout the region made it possible for many mines to work four or five days last week, merely supplying immediate demand. Slow steam movement was the principal worry. In the Mt. Olive district most mines have been tied up because of the sluggishness of small sizes. Good Illinois screenings were sold as low as $1.60, though the average was above that figure.

St. Louis Market Brisk Too

The coldest weather of the winter ushered in last week with a temperature of 4 deg. above zero. It found the dealers' yards pretty well loaded and in two days they were cleaned up, principally selling the cheaper grades of Standard and Mt. Olive. For the first time in years the dealers were able to meet an unexpected contingency. This helped to clean up a lot of high-priced coal put in storage several weeks ago. Domestic business for the country was perhaps the most active at any time in the past three months, while country steam was slow.

The terminal situation in St. Louis is bad. The Missouri Pacific, Frisco and Wabash are unable to take care of the

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

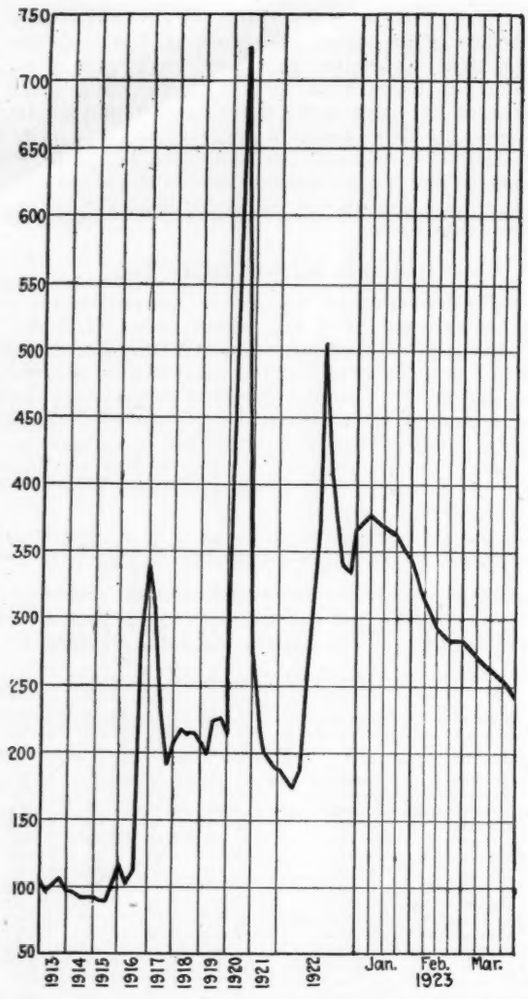
	Market Quoted	Mar. 27 1922	Mar. 12 1923	Mar. 19 1923	Mar. 26 1923†
Low-Volatile, Eastern					
Smokeless lump	Columbus	$2.75	$7.00	$7.00	$6.50@$7.50
Smokeless mine run	Columbus	1.75	4.50	4.50	4.25@ 4.75
Smokeless screenings	Columbus	1.25	4.45	4.25	**4.25@ 4.75**
Smokeless lump	Chicago	2.70	7.00	6.35	6.00@ 6.75
Smokeless mine run	Chicago	1.35	4.00	4.00	3.50@ 4.50
Smokeless lump	Cincinnati	2.75	6.85	7.00	*6.50@ 7.00*
Smokeless mine run	Cincinnati	1.70	4.85	4.85	*4.25@ 5.00*
Smokeless screenings	Cincinnati	1.15	4.50	4.75	*4.00@ 5.00*
*Smokeless mine run	Boston	4.55	7.00	7.10	*6.25@ 6.75*
Clearfield mine run	Boston	1.95	3.30	3.05	*2.25@ 3.00*
Cambria mine run	Boston	2.45	4.00	3.85	*3.25@ 4.00*
Somerset mine run	Boston	1.90	3.60	3.35	*2.75@ 3.50*
Pool 1 (Navy Standard)	New York	2.85	4.50	4.35	*4.00@ 4.50*
Pool 1 (Navy Standard)	Philadelphia	2.80	4.60	4.55	*4.25@ 4.75*
Pool 1 (Navy Standard)	Baltimore	2.65	.....	.....	.....
Pool 9 (Super. Low Vol.)	New York	2.25	3.80	3.60	*3.25@ 3.75*
Pool 9 (Super. Low Vol.)	Philadelphia	2.15	3.85	3.80	*3.30@ 4.10*
Pool 9 (Super. Low Vol.)	Baltimore	2.25	4.00	3.50	.....
Pool 10 (H.Gr.Low Vol.)	New York	2.10	3.10	3.10	*2.75@ 3.25*
Pool 10 (H.Gr.Low Vol.)	Philadelphia	1.90	3.20	3.15	**3.00@ 3.45**
Pool 10 (H.Gr.Low Vol.)	Baltimore	2.15	3.00	3.25	.....
Pool 11 (Low Vol.)	New York	1.80	2.45	2.55	*2.25@ 2.75*
Pool 11 (Low Vol.)	Philadelphia	1.70	2.70	2.55	**2.30@ 2.90**
Pool 11 (Low Vol.)	Baltimore	2.05	2.25	2.35	.....
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.55	2.20	2.35	**2.25@ 2.50**
Pool 54-64 (Gas and St.)	Philadelphia	1.40	2.15	2.25	**2.15@ 2.45**
Pool 54-64 (Gas and St.)	Baltimore	1.55	2.25	2.40	.....
Pittsburgh scr'd gas	Pittsburgh	2.65	3.60	4.05	*3.25@ 4.00*
Pittsburgh mine run (St.)	Pittsburgh	1.85	2.55	2.35	2.25@ 2.50
Pittsburgh slack (Gas)	Pittsburgh	1.55	2.75	2.60	*2.50*
Kanawha lump	Columbus	2.30	4.25	4.25	**4.00@ 5.00**
Kanawha mine run	Columbus	1.50	2.60	2.60	**2.50@ 3.00**
Kanawha screenings	Columbus	1.35	2.10	2.05	**2.25@ 2.60**
W. Va. lump	Cincinnati	2.15	3.75	3.75	*3.25@ 4.00*
W. Va. Gas mine run	Cincinnati	1.95	2.85	3.35	*2.50@ 3.00*
W. Va. Steam mine run	Cincinnati	1.35	2.75	3.00	*2.50@ 3.00*
W. Va. screenings	Cincinnati	1.30	2.50	2.35	2.25@ 2.50
Hocking lump	Columbus	2.55	4.00	3.75	3.50@ 4.00
Hocking mine run	Columbus	1.75	2.40	2.35	*2.35@ 2.60*
Hocking screenings	Columbus	1.45	2.00	1.95	**1.90@ 2.20**
Pitts. No. 8 lump	Cleveland	2.80	4.00	3.70	*2.75@ 3.50*
Pitts. No. 8 mine run	Cleve'and	$1.85	$2.90	$2.70	*$2.25@$2.50*
Pitts. No. 8 screenings	Cleveland	1.70	2.75	2.50	*2.00@ 2.25*
Midwest					
Franklin, Ill. lump	Chicago	3.25	4.60	3.85	3.85
Franklin, Ill. mine run	Chicago	2.25	3.35	3.35	*3.00@ 3.25*
Franklin, Ill. screenings	Chicago	2.00	2.35	2.35	*1.90@ 2.25*
Central, Ill. lump	Chicago	2.60	3.10	3.10	3.00@ 3.25
Central, Ill. mine run	Chicago	2.25	2.60	2.60	2.50@ 2.75
Central, Ill. screenings	Chicago	1.85	1.45	1.60	1.50@ 1.75
Ind. 4th Vein lump	Chicago	3.15	3.60	3.60	3.50@ 3.75
Ind. 4th Vein mine run	Chicago	2.35	2.85	2.85	2.75@ 3.00
Ind. 4th Vein screenings	Chicago	2.15	2.10	2.10	*1.75@ 2.00*
Ind. 5th Vein lump	Chicago	2.85	3.35	3.10	3.00@ 3.25
Ind. 5th Vein mine run	Chicago	2.20	2.60	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	1.75	1.35	1.60	1.50@ 1.75
Standard lump	St. Louis	2.45	3.10	3.10	*2.50@ 2.75*
Standard mine run	St. Louis	1.85	2.25	2.25	*2.00@ 2.25*
Standard screenings	St. Louis	1.35	1.35	1.25	*.90@ 1.00*
West Ky. lump	Louisville	2.35	3.05	2.80	*2.25@ 2.75*
West Ky. mine run	Louisville	1.75	2.00	1.85	**1.85@ 2.25**
West Ky. screenings	Louisville	1.60	1.65	1.65	**1.60@ 1.85**
West Ky. lump	Chicago	.....	3.10	2.85	2.75@ 3.00
West Ky. mine run	Chicago	.....	1.80	1.80	1.75@ 1.85
South and Southwest					
Big Seam lump	Birmingham	2.10	.....	.....	2.50
Big Seam mine run	Birmingham	1.85	2.10	.....	2.00@ 2.25
Big Seam (washed)	Birmingham	1.85	2.60	.....	*2.25@ 2.50*
S. E. Ky. lump	Chicago	.....	4.60	4.60	*3.50@ 4.00*
S. E. Ky. mine run	Chicago	.....	2.85	2.85	2.75@ 3.00
S. E. Ky. lump	Louisville	2.10	5.00	5.05	*3.75@ 4.25*
S. E. Ky. mine run	Louisville	1.55	2.60	2.75	**2.50@ 3.25**
S. E. Ky. screenings	Louisville	1.40	2.20	2.50	*2.00@ 2.50*
S. E. Ky. lump	Cincinnati	2.10	3.75	3.60	*3.00@ 4.00*
S. E. Ky. mine run	Cincinnati	1.30	2.75	2.75	*2.25@ 2.75*
S. E. Ky. screenings	Cincinnati	1.25	2.25	2.35	*2.00@ 2.50*
Kansas lump	Kansas City	4.50	4.50	4.50	4.50
Kansas mine run	Kansas City	4.00	3.50	3.50	3.50
Kansas screenings	Kansas City	2.50	2.60	2.60	2.60

* Gross tons, f.o.b. vessel, Hampton Roads.
† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Latest Independent	Pre-Strike Company	March 19, 1923 Independent	March 19, 1923 Company	March 26, 1923† Independent	March 26, 1923† Company
Broken	New York	$2.34	.....	$7.60@$7.75	$9.00	$7.75@$8.25	$9.00	$7.75@$8.25
Broken	Philadelphia	2.39	$7.00@$7.50	7.75@ 7.85	.....	7.90@ 8.10	.....	7.90@ 8.10
Egg	New York	2.34	7.60@ 7.75	7.60@ 7.85	9.25@11.00	8.00@ 8.35	9.25@11.00	8.00@ 8.35
Egg	Philadelphia	2.39	7.25@ 7.75	7.75	9.25@11.00	8.10@ 8.35	9.25@11.00	8.10@ 8.35
Egg	Chicago*	5.09	7.50	8.25	12.00@12.50	7.20@ 8.25	12.00@12.50	7.20@ 8.25
Stove	New York	2.34	7.90@ 8.20	7.90@ 8.10	9.25@11.00	8.00@ 8.35	9.25@11.00	8.00@ 8.35
Stove	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.25	9.25@11.00	8.15@ 8.35	9.25@11.00	8.15@ 8.35
Stove	Chicago*	5.09	7.75	8.25	12.00@12.50	7.35@ 8.25	12.00@12.50	7.35@ 8.25
Chestnut	New York	2.34	7.90@ 8.20	7.90@ 8.20	9.25@11.00	8.00@ 8.35	9.25@11.00	8.00@ 8.35
Chestnut	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.15	9.25@11.00	8.15@ 8.35	9.25@11.00	8.15@ 8.35
Chestnut	Chicago*	5.09	7.75	8.25	12.00@12.50	7.35@ 8.35	12.00@12.50	7.35@ 8.35
Range	New York	2.34	.....	.....	.....	8.25	.....	8.25
Pea	New York	2.22	5.00@ 5.75	5.75@ 6.45	6.30@ 9.00	6.15@ 6.30	*6.30@ 8.50*	6.15@ 6.30
Pea	Philadelphia	2.14	5.50@ 6.00	6.10@ 6.25	7.00@ 9.00	6.15@ 6.20	7.00@ 9.00	6.15@ 6.20
Pea	Chicago*	4.79	6.00	6.25	7.00@ 8.00	5.49@ 6.03	7.00@ 8.00	5.49@ 6.03
Buckwheat No. 1	New York	2.22	2.75@ 3.00	3.50	3.75@ 4.25	4.00@ 4.10	*3.40@ 4.25*	4.00@ 4.10
Buckwheat No. 1	Philadelphia	2.14	2.75@ 3.25	3.50	4.00@ 5.00	4.00	4.00@ 5.00	4.00
Rice	New York	2.22	2.00@ 2.50	2.50	2.25@ 3.00	2.75@ 3.00	*2.25@ 2.75*	2.75@ 3.00
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	2.75@ 3.00	2.75@ 3.00	2.75@ 3.00	2.75@ 3.00
Barley	New York	2.22	1.50@ 1.85	1.50	1.40@ 2.00	1.50@ 2.00	*1.25@ 1.75*	1.50@ 2.00
Barley	Philadelphia	2.14	1.50@ 1.75	1.50	1.40@ 2.00	2.00	1.40@ 2.00	2.00
Birdseye	New York	2.22	.....	2.00@ 2.50	.....	2.10	.....	2.10

* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 246, Week of March 26, 1923. Average spot price for same period $2.98. This diagram shows the relative, not the actual prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the war Industries Board.

tonnage offered and the Terminal Association ties up traffic on the east side. There is no anthracite moving in and very little activity in coke or smokeless.

Screenings Heavy in Northwest

The cold snap caused some suffering in the Northwest. Domestic coals of all sorts sold recklessly. Deliveries were altogether too slow and almost anything burnable was demanded. However, steam coals on the docks moved sluggishly. A price drop of $1 to $1.25 in Youghiogheny and Hocking screenings featured the Head of the Lakes market last week, but despite the off price in screenings, lump and run of pile in Youghiogheny and Hocking remained firm. Lump at Duluth was $8.25@$8.50 and run of pile $7@$7.25. The market was clean of Pocahontas lump and anthracite.

Speculation is rife concerning the probable price of coal after the opening of navigation. It is asserted that bituminous will be at least $1.50 to $2 lower than at present. Bottoms have been chartered to bring up a supply of anthracite as soon as navigation opens, and there has been some chartering for the movement of bituminous. Navigation should open about April 20.

The docks are preparing for a heavy season, providing rates from the mine can be made so as to enable Duluth to compete with the cheaper Illinois coal, which has the advantage now because of the freight rates.

Situation in Milwaukee Nears Normal

The coal situation in the Milwaukee district is rapidly getting back to normal after the worst flurry of the season. Two mid-March blizzards within a week sent people to the yards for fuel of any discription. There was practically no anthracite on hand and not much bituminous or coke were available. The storms seriously impeded rail transportation, but there is considerable coal now coming forward.

Better buying of coal by industrials, byproduct and utility consumers is reported in the Louisville market, and while not much coal is moving to steel industries on open-market orders the steel interests that produce their own coal are not offering it in the open market, which has helped somewhat. General inquiry was better and there was some contract inquiry at prices that seemed attractive. Railroad buying also showed improvement.

L. & N. Issues Shipping Permits

The Louisville & Nashville R.R. has announced that Lake shipping permits are being issued and it is estimated that about 3,500,000 tons will be moved within the next few months. According to a statement issued Kentucky probably will have a larger share of lake business this year than in past seasons. Permits are issued only where the operator has arranged for immediate unloading at lake ports.

Although two snow storms swept down the eastern front of the Rockies the coal trade in that region was not much affected. True, the Kansas City market improved, dealers unloaded a good deal of high-priced coal, and mines picked up in operating time from about 25 per cent to almost 75 per cent. But even that was temporary. In Colorado the new low storage price aimed to stimulate trade has not had the desired effect. About the only mines working anywhere near full time in Colorado are those with railroad contracts. Most lignite operations average three days a week.

Utah business remains unflurried. Lump prices thus far have remained firm but steam coals are difficult to move. Production continues at little better than 50 per cent.

Smokeless Goes All Rail to Milwaukee

Because of the barren condition of the Milwaukee docks some smokeless moved there all rail from the Cincinnati gateway. Lake buyers jumped into the market the early part of the week and filled up with a couple of cargoes for the boats lying at Lake Erie ports, but during the latter part of the week buying was conspicuous by its absence.

The first circular on April prices for smokeless coal shows $6 for lump and egg, $6 for nut and $4.50 for run of mine with no price on screenings. There has been some stocking going on in the smaller towns along the river and some tonnage has been laid away in and around Cincinnati.

Reports from Columbus indicate that prices on contract coal from the Hocking Valley and other Ohio fields probably will range $2.50@$2.75 for mine run although this is not settled. Steam plants have only a fair surplus stock and this is taken as an indication that there will be fair buying later on. Iron and steel plants are buying more actively and orders from utilities are fairly good. The Lake trade is attracting attention.

The Cleveland market has sagged to lower levels, demand has noticeably disappeared and spot prices are lower.

Broadening of the markets for West Virginia smokeless nut and slack coals seems to have been accomplished through buying by some of the steel mills of Pennsylvania and Ohio and quite a large tonnage of this grade of coal it is said, is now being contracted for and shipped.

The Birmingham (Ala.) spot market, while not especially active, is sufficiently strong to move all coal not covered by contract. Bunker coal shipments are fairly good. Production is being maintained at a high level, though car shortage continues bad and is curtailing output to a marked degree.

No Active Buying Foreseen in New England

The trade in New England believes there will be further transportation difficulties. The degree to which this will be felt there naturally will depend upon the volume of coal required, but the outlook is for no such expanded tonnages

as were estimated four and five years ago. Fuel oil has not yet begun to withdraw as an active competitor and last year's experience taught the market that the West Virginia districts, in the absence of any swollen demand overseas, are amply able to take care of this market with only moderate support from central Pennsylvania. Certainly there are no present indications of active buying in this territory.

The contract situation in New England seems to develop very slowly. Aside from factors who have their own wharves there is caution in this respect because of costly experiences at railroad berths during the past season. So much demurrage has been paid that buyers naturally want to make their contracts f.o.b. cars while the agencies are more and more seeking season orders at a fixed price f.o.b. mines plus charges. There is an abundance of shipping and coastwise freights are likely to be on the same moderate basis that prevailed last year. As usual, the great bulk of New England's coal will come forward in steamers, and this situation makes it more and more difficult for the smaller interests to maintain an even flow of coal to New England.

Many Pittsburgh consumers, it is reported, would be glad to make contracts either for short periods or preferably for the coal year to April 1, 1924, but operators have been unwilling to commit themselves. Export demand for gas coal continues heavy.

The outlook in the central Pennsylvania fields is better. Coal operators from that district who have recently visited inland New York and the New England states believe there will be large quantities of coal stored during the summer. Production is increasing.

New York Shippers Are Optimistic

Demand at New York was slow but operators and shippers are optimistic, basing their hopes on low stocks all over the country and the opening of Lake navigation.

Consumers in and around Philadelphia are buying only to meet immediate needs. It is unusual to see a plant with more than an ordinary supply of coal on hand.

Buying at Buffalo is slow. Prices are low and some believe they cannot go much lower. Continued export demand would, it is believed, improve conditions.

Anthracite Trade Expects Busy Spring

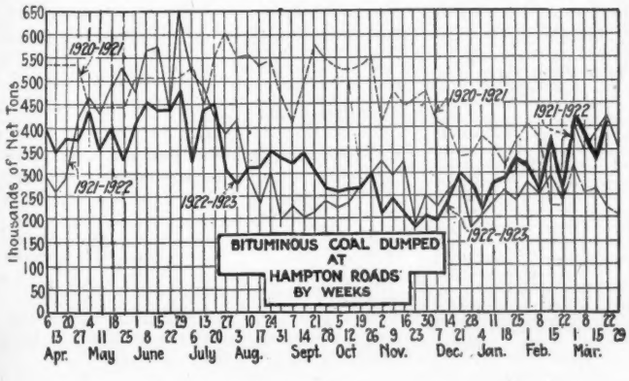
Anthracite producers and retail dealers look for a busy spring and summer. Most yards are without surplus supplies and consumers are anxious, for the most part, to get in their next winter's fuel. Quotations for independent domestic sizes are easier, some retail dealers depending upon the larger companies for most of their tonnage. The steam sizes are moving slowly.

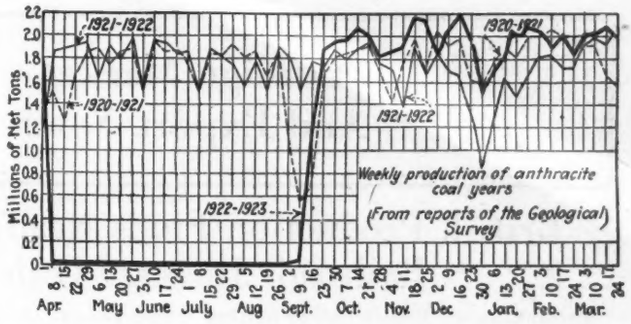
"The production of anthracite in the week ended March 17" says the Geological Survey, "is estimated on the basis of 39,334 cars loaded, at 2,057,000 net tons including mine fuel, local sales and dredge and washery output. This was a slight increase over the week before despite a considerable loss of output on St. Patrick's Day.

"Early returns for the first four days of last week indicate production at a rate which will bring the week's total to over 2,000,000 tons.

"The revised estimate of anthracite production in February, based on final data on shipments in that month, is 7,773,000 net tons, including mine fuel, local sales and dredge and washery output. This amount has been exceeded in only one February (1921) since the beginning of the Geological Survey's record of monthly production,

"The cumulative production of anthracite during the present coal year to the end of February stands at 47,194,000 net tons. This is 41 per cent less than for the corresponding period of the coal year preceding and 44 per cent less than the average for the same period of the past nine coal years."





Kansas Blast Kills 3 and Injures 3

Three men were killed and three were severely injured March 19 in an explosion resulting from an overcharged shot in Thompson, Roberts & Gesslein mine No. 1, Mulberry, Kansas, which the six men were working cooperatively. Thomas Pearson, a veteran miner of the district, who was among those killed, was a candidate in December for secretary-treasurer of District 14, United Mine Workers. More recently he had been considered a possible appointee by Governor Davis to the office of state mine inspector. Richard Medland and Shelton Reeder were the others that were killed. The injured were Dave Curran, Ed Reeder and Loren Reeder. Curran fired the shot.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Jan. 1 to Apr. 1, 1922 Inclusive	Sept. 5 to Dec. 30, 1922 Inclusive	Jan. 1 to Mar. 10, 1923 Inclusive	Week Ended Mar. 10, 1923
U. S. Total	55.7	....	....	....
Alabama	64.6	84.7	89.0	(a)
Somerset County	74.9	36.3	28.0	29.4
Panhandle, W. Va.	51.3	57.3	55.3	48.1
Westmoreland	58.8	65.8	52.7	47.8
Virginia	59.9	55.7	53.3	55.1
Harlan	54.8	22.1	21.6	26.4
Hazard	58.4	16.4	18.6	18.7
Pocahontas	60.0	36.6	37.6	43.8
Tug River	63.7	28.8	34.0	35.9
Logan	61.1	26.2	30.8	28.0
Cumberland-Piedmont	50.6	31.7	45.3	47.3
Winding Gulf	64.3	30.4	32.9	37.5
Kenova-Thacker	54.3	42.4	38.7	(a)
N. E. Kentucky	47.7	28.4	28.2	27.7
New River	37.9	31.6	34.3	34.7
Oklahoma	59.6	59.1	42.0	48.1
Iowa	78.4	75.9	80.6	73.8
Ohio, Eastern	46.6	40.8	34.1	35.2
Missouri	66.8	76.3	76.4	70.8
Illinois	54.5	49.9	51.0	42.0
Kansas	54.9	55.9	49.4	39.1
Indiana	53.8	37.7	54.8	(a)
Pittsburgh†	39.8	41.2	32.0	30.5
Central Pennsylvania	50.2	53.4	44.6	53.4
Fairmont	44.0	35.5	36.5	37.8
Western Kentucky	37.7	32.4	33.9	35.5
Pittsburgh*	31.9	56.1	61.4	56.3
Kanawha	13.0	15.6	22.0	27.3
Ohio, Southern	24.3	38.1	32.4	27.1

* Rail and river mines combined.
† Rail mines.
(a) No report.

Car Loadings, Surplusages and Shortages

	Cars Loaded All Cars	Cars Loaded Coal Cars
Week ended March 10, 1923	905,219	186,327
Previous week	917,896	193,561
Same week in 1922	820,886	203,815

	Surplus Cars All Cars	Surplus Cars Coal Cars	Car Shortage	
March 7, 1923	13,229	4,127	79,270	34,642
Feb. 28, 1923	15,819	4,845	80,633	38,771
Same date in 1923	223,846	86,464	.....	.....

Foreign Market And Export News

British Production Finds Ready Market; Railroads Increase Orders

Production of British mines during the week ended March 10 reached 5,713,000 tons according to a cable to *Coal Age*. This is 147,000 tons more than in the preceding week and the largest output of any week of the present year.

The threatened trouble among the mine workers is reported to have been settled by the non-unionists joining the Miners' Federation.

According to a newspaper dispatch an inquiry is to be made into the necessity of establishing a third shift of coal tippers and trimmers in the South Wales exporting district.

The pressure on the Welsh market is becoming heavier. Collieries are very well booked ahead.

The Paris-Lyons-Mediterranean Railway Company has ordered an additional half-million tons for delivery over the remainder of the year. Other French railways are also in the market for several months ahead.

From records of weekly shipments it is noticeable that the pre-war export to South America is rapidly being regained.

There has been no weakening in the north of England market in spite of the increased competition from the U. S. The bulk of the American business has been to Italy.

Coal exports officially reported from London for the weeks ended March 16 and March 23 were, in tons:

	March 16	March 23
Mersey	6,415	7,465
Newcastle (Tyne) district	2,110	9,400
Clyde	....	269
South Wales	....	13,881

Dumpings at Hampton Roads Increase

Business at Hampton Roads continued on the upward trend last week with prices firm and with a steady increase in dumpings at all piers. During the first eighteen working days of the month a total of 1,020,000 tons had been dumped, with nine more days to go.

Continued movement of coal to Germany and South America was the main feature of the trade, the outlook for improvement in export business being unusually bright. Coal moved in increasing volume to Dutch ports, also.

Domestic trade is falling off substantially, due to the advent of spring. Improvement in the car situation was shown, and was reflected in the increase in stocks at tidewater, 100,000 tons more than at the end of the previous week being on hand at the piers. The tone of the market was strong, and the general feeling highly optimistic.

Export Clearances, Week Ended March 17, 1923

FROM HAMPTON ROADS

	Tons
For Brazil:	
Nor. SS. Arna, for Buenos Aires	7,150
For Germany:	
Nor. SS. Luise Nielsen, for Hamburg	7,676
Nor. SS. Niels Nielsen, for Hamburg	7,510
For Holland:	
Br. SS. Fullerton, for Rotterdam	4,515
Du. SS. Menado, for Rotterdam	6,513
For Italy:	
Ital. SS. Numidia, for West Italy	7,010
For Spain:	
Br. SS. Lowlands, for Gibraltar	5,016
For West Indies:	
Nor. SS. Alm. for Curacao	1,765
Amer. Schr. Margaret Spencer, for St. Georges	1,232
For ———:	
Nor. SS. Navarra, for Puerto Tarafa	1,526

FROM PHILADELPHIA

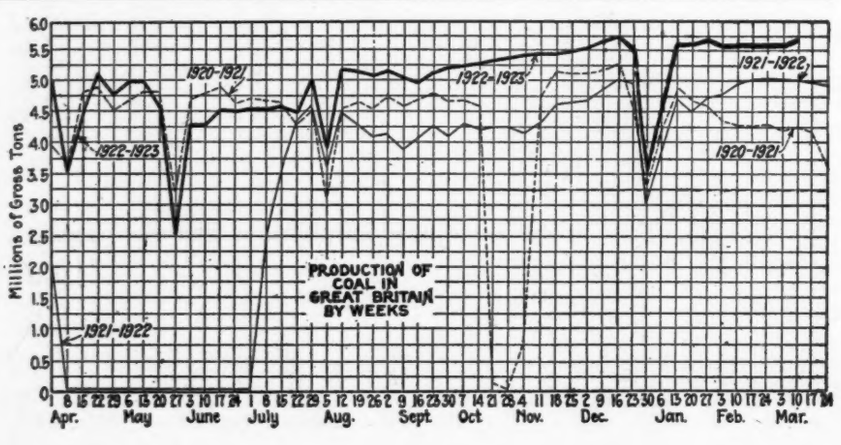
For Cuba:	
Dan SS. Phenix, for Havana	...
For France:	
Greek SS. Demokratia, for Dunkirk. (coke)	
For Nova Scotia:	
Br. Scr. James William, for Halifax	...

Switzerland Coal Imports

There were imported into Switzerland during the period Jan. 1 to Feb. 15, this year 203,514 tons of coal, according to statistics given out by the Federal Department of Political Economy at Berne. The coal came from the following countries:

	Tons
Germany without Saar	44,373
Saar District	44,070
France	67,354
Belgium	47,717

The imports from Germany without Saar during the first half of February consisted of 2,300 tons of bituminous coal, 4,700 tons of coke and 2,700 tons of briquets.



United States January Coal Exports by Custom Districts

(In Gross Tons)

	Anthracite	Bituminous	Coke
Maine & New Hampshire	8	67	248
Vermont	1,228	938	958
St. Lawrence	108,787	184,166	6,146
Rochester	3,075	43,691	.....
Buffalo	226,379	404,895	40,833
New York	8,408	26	1,536
Philadelphia	3,229	9,853	2,183
South Carolina	3,084	7,512	.....
Maryland	.....	511	.....
Virginia	.....	59,158	227
Florida	146	7,142	1,561
Mobile	.....	320	.....
New Orleans	.....	486	473
Sabine	.....	20	.....
San Antonio	93	42	.....
El Paso	98	4,440	1,324
San Diego	1	29	1
Arizona	1	2,003	4,583
Washington	89	3,872	.....
San Francisco	.....	.....	10
Dakota	1,244	8,064	7,238
Duluth & Superior	.....	5,775	1
Michigan	125	233,072	10,057
Ohio	.....	116,002	378
Porto Rico	31	.....	2
Totals	356,016	1,092,084	77,759

United States January Coal Exports

(In Gross Tons)

	Jan., 1922	Jan., 1923
Coal:		
Anthracite	224,040	356,016
Bituminous	643,913	1,092,084
Exported to:		
Italy	8,206	6,361
Netherlands	.....	1
Other Europe	.....	511
Canada	526,016	1,001,650
Panama	9,625	9,440
Mexico	7,177	6,534
British West Indies	1,751	1,139
Cuba	41,240	59,664
Other West Indies	10,872	6,253
Argentina	14,566	.....
Brazil	12,365	.....
Chile	680	.....
Egypt	7,199	.....
Other countries	4,216	531
Coke	30,732	77,759

Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.	Mar. 15	Mar. 22
Cars on hand	707	1,479
Tons on hand	49,990	93,400
Tons dumped for week	131,863	121,665
Tonnage waiting	11,475	12,000
Virginian Ry. piers, Sewalls Pt.		
Cars on hand	1,354	1,672
Tons on hand	78,080	92,560
Tons dumped for week	107,822	108,225
Tonnage waiting	10,697	26,402
C. & O. piers, Newport News		
Cars on hand	1,375	1,891
Tons on hand	75,750	102,680
Tons dumped for week	67,505	133,712
Tonnage waiting	5,620	11,320

Pier and Bunker Prices, Gross Tons

PIERS

	March 17	March 24†
Pool 9, New York	$6.75@$7.25	*$6.65@$7.00*
Pool 10, New York	6.00@ 6.40	*5.75@ 6.25*
Pool 11, New York	5.25@ 5.75	*4.50@ 5.50*
Pool 9, Philadelphia	7.00@ 7.40	7.00@ 7.40
Pool 10, Philadelphia	6.25@ 6.50	*6.15@ 6.50*
Pool 11, Philadelphia	5.25@ 5.70	5.25@ 5.70
Pool 1, Hamp. Roads	7.25	*6.75@ 7.00*
Pools 5-6-7 Hamp. Rds.	6.40@ 6.65	*6.00*
Pool 2, Hamp. Rds.	7.25	6.75@ 7.00

BUNKERS

Pool 9, New York	7.05@ 7.55	*6.95@ 7.30*
Pool 10, New York	6.30@ 6.70	*6.05@ 6.55*
Pool 11, New York	5.50@ 6.05	*4.80@ 5.80*
Pool 9, Philadelphia	7.20@ 7.50	7.20@ 7.50
Pool 10, Philadelphia	6.50@ 6.75	*6.45@ 6.75*
Pool 11, Philadelphia	5.35@ 6.00	*5.30@ 6.00*
Pool 1, Hamp Rds.	7.25	*7.00*
Pool 2, Hamp. Rds.	7.25	*7.00*

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	March 17	March 24†
Admiralty, large	34s.@35s.	**35s.@37s.6d.**
Steam, smalls	26s.@27s.	**27s.6d.@30s.**
Newcastle:		
Best steams	34s.@35s.	*33s.6d.@35s.*
Best gas	35s.	*33s.@35s.*
Best bunkers	35s.@37s.6d.	*32s.6d.@35s.*

ances over previous week shown in **heavy** type; declines in *italics*.

News Items From Field and Trade

ALABAMA

The Munro-Warrior Coal Co., Birmingham, is reported to have acquired the No. 2 mine of the Black Creek Coal Co. at Nauvoo, Walker County, and it is understood will build new tipple, washer, etc., and electrify the mine. The property embraces a large tract of Black Creek coal, which is one of the best domestic fuels on the market.

The Kewanee Coal Co., Jasper, has acquired the properties of the Smith-Duffee Coal Co. and contemplates the operation of two or three new mines.

The Brilliant Coal Co., Birmingham, with operations at Brilliant, Marion County, it is reported, is considering the erection of a new washer, tipple and power house at its mines and the purchase of electrical equipment to be used in the operation of its No. 5 and No. 7 mines. These openings are on the Brilliant Black Creek seam of coal, which is a high grade domestic fuel and it is understood the holdings comprise about 8,000 acres.

Charles M. Sartain, F. M. Sartain and Frank Boyer have incorporated the **Sartain-Boyer Coal Co.** at Jasper, with a capital of $150,000.

The Alco Coal Co. has been incorporated at Tuscaloosa, with J. D. Henderson, Fleetwood Rice and Hunter M. Smith as incorporators and with a capital stock of $20,000.

COLORADO

The Colorado Fuel & Iron Co., at the annual stockholders' meeting held March 19 in the company's office in Denver, **with one exception re-elected the old Board of Directors.** Arthur Woods, of New York, was chosen in the place formerly held by Raymond B. Fosdick. The following now comprise the board: George B. Berger, William V. Hodges, S. G. Pierson, J. F. Welborn, Fred Farrar, John C. Mitchell, and Albert A. Reed, of Denver; E. H. Weitzel and M. D. Thatcher, of Pueblo; A. L. Boulware, J. H. McClement, Arthur Woods, and Kingdon Gould, of New York. Following the approving of the report of the officers and the adjournment of the stockholders' meeting the directors re-elected the following officers: J. F. Welborn, president; Fred Farrar, executive vice-president; S. G. Pierson, E. H. Weitzel, Arthur Woods, A. H. Lichty, vice-presidents; Fred Farrar, secretary. Other officials of the company are: R. L. Hearon, traffic manager; Thomas Aurelius, manager of sales; A. W. Sampson, general auditor; J. B. Marks, purchasing agent; F. H. Bentley, statistiican; P. A. Welting, asst. treasurer; P. E. Thatcher, cashier; Fred Farrar, general counsel; Wendell Stephens, attorney; E. V. Cary, L. B. Rogers, assistant secretaries; F. E. Parks, manager steel mills; D. A. Stout, manager fuel department; L. B. Weed, general superintendent iron mines and quarries; E. H. Weitzel, general manager.

W. D. McCausland, general manager of the Leyden Coal Co., has engaged James Virgin for superintendent of the Leyden mine, near Denver. Mr. Virgin hails from Johnstown, Pa. He had been employed for seven years by Mr. McCausland, when the latter was operating mines in Pennsylvania and West Virginia. **J. E. McLaughlin** has been appointed mine foreman.

Prairie Canon Mine, of the Prairie Canon Coal Co., Vallorso, located in Las Animas County, on the C. & S. R.R., which closed in September, 1921, was reopened in May, 1922.

Sante Fe Mine, of the Sante Fe Coal Co., Denver, located in the Las Animas County, on the A. T. & S. F. R.R., which closed in February, 1921, was reopened in June, 1922.

The Young Mine; Young & Caddell, of Denver, operators; located in Las Animas County, on the D. & R. G. W. R.R., a new mine, was opened in December, 1922.

Piston Mine, Colorado Fuel & Iron Co., Pueblo, located in Huerfano County, on the D. & R. G. W. R.R., which closed in December, 1921, was reopened in August, 1922.

Kebler No. 1 Mine, of the Colorado Fuel & Iron Co., Pueblo, located in Huerfano County, on the D. & R. G. W. R.R., which closed in December, 1921, was reopened in August, 1922.

Sunnyside Mine, of the Sunnyside Coal Mining Co., Denver, located in Huerfano County, on the D. & R. G. W. R.R., which closed in November, 1921, was reopened in June, 1922.

ILLINOIS

Work on the **proposed mine of the Illinois Coal Corporation**, which will be sunk in Elk Prairie township, in Jefferson County, is scheduled to begin late in March. The company owns several thousand acres of coal lands in Jefferson County, and it is said the mine will be one of the largest producers in the country.

According to an announcement made at the office of the superintendent of the St. Louis division of the Illinois Central R.R., **construction work on the cut-off from Edgewood, Ill., to Fulton, Ky., will be under way within 10 days.** Work will be started all along the route, according to the announcement, in spite of any action which has been started or may be begun to prevent the construction of the line.

The Harrisburg Fuel Co., Ledford, Saline County, have reopened their mine, closed in April, 1921, located on the Big Four. This company has another mine at Harrisburg.

The Saline Gas Coal Co., at Harrisburg, Saline County, **has opened a new mine** on the Big Four. This company has another mine at Ledford.

William Van Hoose, of Cambria, Williamson County, **has opened a new mine** at that place.

The Franklin Coal & Coke Co., at Royalton, Franklin County, **has reopened mine No. 2**, on the Missouri, Pacific and the C. B. & Q. Rys., closed in May, 1921. The company has two other mines, located at Royalton.

Five of the Old Ben collieries located in Franklin and Williamson counties have been closed indefinitely. While the lack of any market for the coal produced by these mines is given as the primary reason for the indefinite suspension of work, it is also the intention of the company, according to reports, to make some needed repairs and improvements during the suspension. The mines affected are No. 14, at Buckner; No. 15, at Pershing; No. 16, at Rend; No. 17, at Rendville, all in Franklin County, and No. 20, at Johnston City, in Williamson County. At the Buckner mine it is also announced that a considerable amount of work will be done on the shaft, which will be concreted. At Pershing operations will be resumed as soon as a new sizing plant can be installed, and other improvements made which will facilitate greater production.

The Southern Mining Co. has purchased a tract of 555 acres near and to the east of the town of Hegeler, a village in the Danville mining district. The tract is underlaid with coal.

The Rex Coal Mining Co. has reached coal at a depth of 154 ft. on its 600-acre lease near Warner. The vein has a thickness of 4 ft. 8 in. This is the third vein. The first vein, 26 in. thick, was found at a depth of 35 ft., and the second vein, of 14 in., at 95 ft., neither of which will be worked. The company is incorporated for $20,000. Harry E. Bishop is the president; Clarence Hintz, vice-president, and Charles W. Krueger, secretary and treasurer.

The top works of **Wasson No. 1 mine**, near Harrisburg, are to be rebuilt at once.

Railroads operating in the Franklin and Williamson County fields have abolished the position of car distributor because of low business. During the car shortage in the fall and early winter the railroads jointly employed a car distributor apportioning cars to 60 mines.

The **C. B. & Q. R.R.** is doing the preliminary work toward the construction of a double track between Waltonville and Woodlawn. It is said the company is **planning to double track its system in the coal fields.** The **Illinois Central** plans to construct a line from Zeigler, in Franklin county, to a point in Saline county, to connect with the Edgewood-Metropolis cut-off. Articles of incorporation have been filed by the road for the construction of this branch, which will be known as the **Zeigler Junction & Southwestern R.R.**

Mine No. 5 of the Spring Valley Coal Co., located at Spring Valley, will be **closed for an indefinite period.** During the suspension the main shaft will be repaired and other improvements be made around the top works of the plant.

The first death from the gas explosion in the De Koven mine of the Madison Coal Corporation, Feb. 24, has occurred. Elmer Scott, 42, a Central City miner, died in Paducah, March 17. He was one of an inspection party caught by a fire caused by a miner lighting a carbide lamp contrary to orders.

Work of **re-equipping the old Milligan mine at Pinckneyville** is under way and coal will be produced at the shaft before many weeks. The mine has not been operated for some time. A switch is now being constructed from the St. Louis division of the Illinois Central R.R. to the mine. The work is being backed and supervised by William A. Lafont, of Pinckneyville, formerly connected with the firm of Dowell & Lafont, of Duquoin.

The Suburban Coal Co. of Belleville, is the name of a new concern just formed at that place. The new company has been capitalized at $50,000 and owns properties valued at $30,000. The stockholders are John Henderson, V. M. Henderson, Theodore Michaelis and Louise E. Michaelis. John Henderson, who is from St. Louis, has been at the head of the West Virginia Coal Co., of that city, for years.

The St. Clair mine at Freeburg, owned by the General Coal & Mining Co., which was closed down some time ago when the company failed to meet a payroll, **has resumed operations** in full. The mine has been purchased by S. J. Fowler, of East St. Louis, and the name of the company has been changed to the **Free-Belle Mining Co.**

A strip mine near Edgemont owned by the Signal Point Coal & Coke Co., a concern recently organized by Julius C. Miller, of St. Louis, **caved in recently** when operations cut too deeply under the foot of a hill. Jones Brothers, a jobbing concern in St. Louis, selling under the name of the Interstate Fuel Co., are trying in the courts to get an adjustment of their relations with Miller.

The Old Ben Coal Corporation will move its offices from the McCormick Building to the 18th floor of the new Illinois Merchants' Bank Building, corner of Jackson Boulevard and South Clark Street, Chicago, upon completion of the building, which is expected to be ready to receive occupants about March 1.

The M. & B. Coal Co., Danville, **has been incorporated** with a capital of $25,000 by L. T. Mauck, William Mauck, Louis Bock and Paul F. Boch.

The Schuline Mining Co., which recently sank a mine on the J. M. Weir farm, near Sparta, has begun drilling again with the intention of going to the second vein of coal about 110 feet below the surface. The first vein varies in thickness from five inches to five feet, the coal lying in a roll.

The Sackville & Wynn mine at Coal Valley, near Moline, **was closed March 9** for an indefinite period, throwing fifty miners out of work.

The mine at Rutland has been sold by court sale at Ottawa for $16,000. It is said that it was purchased by a group of men including Lee O'Neil Browne, J. L. Bane, former State Senator Cullen and others.

The Glenn Coal Co., of Astoria, has filed articles of incorporation, showing a capitalization of $20,000. The company will mine and deal in coal. The incorporators are E. G. Bader, M. W. Hughes and David E. Thomas.

T. J. O'Gara is disposing of his interest in the **O'Gara Coal Co.**, which operates nine mines in Saline County. Benjamin V. Becker retires with Mr. O'Gara from the board of directors. **Frank H. Woods** remains president, an office he has held since the company was reorganized after bankruptcy several years ago, and **F. A. Manly** continues as vice-president and general manager. Negotiations leading up to the acquiring of the O'Gara holdings in the company by the Woods interests through a New York banking syndicate have been in process for some time.

W. G. Maguire, new president of the St. Louis Coke & Chemical Co., a $17,000,000 corporation, is but 37 years old. His concern is now doing, at its Granite City plant east of St. Louis, a thing that used to be considered commercially impossible—it is coking southern Illinois coal at the rate of about 1,000,000 tons a year.

R. H. Beaumont Co., Philadelphia, announces the appointment of **P. K. Reed as manager of the company's Chicago office**, 760 Monadnock Block.

Plans are being made for the establishment of a mine-rescue and first-aid station at West Frankfort, where 4,000 miners are employed.

Lack of orders caused the **Brewerton No. 2 mine at Lincoln to close down.** This is the largest mine in Lincoln and employs about 300 men. It has an output of slightly over 1,200 tons daily. Its tonnage is handled by the Chicago & Alton R.R. It is also stated that the Riverside mine at Petersburg will soon close.

On the ground that the **Star Coal & Mining Co.**, of Belleville, is insolvent, **D. S. Gent, of Chicago, filed** in the St. Clair County Circuit Court, **a petition for the appointment of a receiver** to take charge of the affairs of the company, of which Anthony F. Jakoubek is president. **Judge George A. Crow appointed Mr. Gent receiver.** Loans totaling $31,830.05, made by Gent as trustee, Feb. 25, 1922, are due and unpaid, according to the petition. The defendants named are the Star Coal & Mining Co., Herman Neff, John Isselhard and F. A. Classen, the three latter having been securities on the notes.

INDIANA

There was a **reduction in the number of miner applicants for certificates and permits in Vigo County** at the March session of the County Board of Mine Examiners. Only 55 certificates and 46 permits were issued, which is **about one-third of the number awarded in February.**

Miners of District No. 11, U.M.W.A., will seek representation in the Indiana State Federation of Labor and are planning to nominate a candidate for one of the executive offices. William Schmidt of West Terre Haute is expected to be their candidate.

"If a coal company owning several mines were allowed during a car shortage to receive its combined allotment day by day at one or two mines an enormous saving would result," William M. Zeller, sales manager for the Knox Consolidated Coal Co. told the Indianapolis Rotary Club recently at a dinner. "Under those conditions our company **would close down the higher-cost mines,"** said he, "reducing operating expense so that we could pass on this reduction to coal buyers."

The Columbus Mining Co. expects to expend more than a half million dollars in development of a large area of recently acquired coal land in Indiana and extensive improvements on mine properties in that state and eastern Kentucky. Allen & Garcia, well-known mining engineers, have been placed in charge of the work. A syndicate headed by H. A. Requa, J. B. Hilton and A. L. Allais has acquired what is declared to be 2,500 acres of rich coal land in Gibson County, Indiana, and the Columbus company will develop that field. The company officials have announced that new shaker screens and picking tables at the Shamrock mine at Reilly and the construction of a huge conveyor up the side of the mountains in the Hazard field in eastern Kentucky are among the improvements contemplated. The tipple of Mine No. 6 in eastern Kentucky will be remodeled and shaker screens and picking tables installed.

The General Fuel Corporation of Terre Haute has filed a notice with the Secretary of State showing **an increase of $400,000 in capital stock.** The total capital stock of the company is $2,400,000. The company is opening some mines in the Gibson county coal field. All officials of the company are Terre Haute men. John T. Beasley is president; C. J. Richards, vice-president and general manager; John Hoke Beasley, secretary, and Frank W. Richards, treasurer.

The right of Indiana coal operators to demand the use of permissible powder in their mines was again questioned this month by a strike of about 800 miners at the American No. 1 Mine, near Bicknell. **After a strike of about 20 days the miners returned to work** when the officials of the company stood firm on their right to use permissibles not only because they are safer and had been recommended by the inspection bureau following an explosion Jan. 12, but also because of a joint agreement of miners and operators made in 1915.

A joint conference of members of the executive boards of District No. 11, U. M. W., and the Indiana Bituminous Coal Operators' Association which met in Terre Haute on March 20, **reached a satisfactory agreement concerning the hauling of miners to and from their work in the mines. According to the agreement reached by the joint conference the miners are to be hauled between their work** and the cage by the mine motormen where such action is warranted. The motormen are to receive additional compensation for the extra work.

KENTUCKY

The Big Sandy field of the Northeast Kentucky Coal Association will be a beehive of progressive work for the next few years, according to recent announcements. A number of contractors have made **estimates for bids on several new tracks** and new track scales for the river yards at Ashland. The improvement will be made as soon as possible and will be a great aid in expediting the movement of tonnage west bound. Extensive improvements in trackage facilities will be made over the entire Big Sandy division of the Chesapeake & Ohio Ry. in order to enable them to meet the great demand for the special purpose quality coals of this field which is exceeding by far the expectations of the most optimistic interests.

The Humyar Coal Co. of Lennut, has announced that it will erect a clubhouse and Y.M.C.A. building.

The 1922 coal output of Pike County was a little more than 6,000,000 tons, according to the report of Grant Phillips, inspector for the eighth district. The average days worked by the 84 mines was 161. Fifty-nine mines are electrically equipped and 25 are pick mines. Of the 7,499 men employed, 1,521 are outside men and 5,978 are employed inside.

The proposed branch of the Illinois Central R.R., from Central City to Madisonville, will tap into about 20 large coal mines, now served only by the Louisville & Nashville R.R., while there have been some big deals on coal lands which can be reached by this new line.

The Pond Creek Coal Co. has declared a final dividend of $10 a share in liquidation, payable April 2 upon delivery of certificates to the First National Bank of Boston, or to the Chase National Bank of New York.

MISSOURI

The steady conversion of Southwestern railroads from coal to oil for fuel is cutting deeper into the business of the southwestern coal fields. The Cotton Belt is changing to oil for its lines south of Pine Bluff, Mo.; the Frisco railroad for its divisions in the Tulsa (Okla.) region and the Rock Island for its Louisiana division in southern Arkansas and Louisiana.

Walter A. Zelnicker Supply Co. removed March 1 from 325 Locust Street to new offices in the Chamber of Commerce Building, 511 Locust St., St. Louis.

Mine No. 2, south of Macon, which has been idle since Jan. 22, **has reorganized and started to work.** The mine is leased from the **Home Coal Co.,** by a co-operative organization consisting principally of employees.

Missouri **coal interests were glad to see fall in the state legislature a bill aimed at chain stores.** It would have limited anyone person or corporation to a maximum of 10 places of business within the state.

Walter W. Graham, formerly superintendent of the American Sale & Coal Co., of Kansas, is now general manager and superintendent of the Mosby Coal Co. of Excelsior Springs.

The Blackfoot coal mine, located about four miles north of Columbia, **has been shut down** on account of fire which destroyed the fan and motor and house which contains the fan. The damage to the mine itself was estimated at only $300.

NEVADA

The **discovery of a 5-ft. coal vein** in the hills east of Wells is reported. The discoverer, Martin Elorga, is attempting to obtain funds to finance the exploration and development of the deposit.

NEW YORK

William B. Simmons, for several years connected with the business department of *Coal Age* and more recently assistant to A. S. Learoyd, District Fuel Administrator for Greater New York and Long Island, is now associated with Sidford & Greene, 17 Battery Place, New York City.

Rembrandt Peale, Jr., vice-president of Peale, Peacock & Kerr, 1 Broadway, New York City, **is sailing this week for Europe.** He will spend several months abroad studying industrial conditions and the market for coal in England and on the Continent.

The following **bids to furnish 45,000 tons of three-quarter slack coal** to the Buffalo waterworks will show what shippers think of the coming bituminous market: Valley Camp Coal Co., Cleveland ($2.39 freight rate), $2 50; McVicker Coal Co., Cleveland ($2.39 rate), $2.25; Weaver Coal Co., ($2.09 rate), $3.15; Carson & Co., Philadelphia ($2.09 rate), $2.75; Barnett Coal & Coke Co. ($2.24 rate), $2.39; Link-On Coal Corp. ($2.24 rate), $2.50; Lake Erie Coal Co., Cleveland ($2.24 rate), $2.45; E. L. Hedstrom ($2.24 rate), $2.25. The Hedstrom bid, which is lowest, was received 13 minutes after the time fixed for closing. It is the impression that all bids will be rejected, as they were last year.

OHIO

The Big Six Coal Co., Cadiz, has been chartered with a capital of $500,000 to mine coal and to do a general shipping business. Incorporators are R. H. Anderson, W. C. Clifford, O. H. Finical, J. W. Freshwater and Charles W. Wenner.

The Green Coal Co., Cadiz, has been incorporatted with a capital of $25,000 to mine and sell coal in the eastern Ohio field. Incorporators are Helen Sharon, J. M. Sharon, J. P. Liggett, O. S. Cramblet and B. E. Blackford.

The City Board of Purchase of Columbus has been authorized by the City Council **to purchase 12,000 tons of nut, pea and slack** for the municipal light plant, garbage-reduction plant and other city departments. Advertisements for bids for this coal will be put into the local papers soon.

The Red Bird mine, near Pomeroy, was closed on March 17 because of the lack of miners to operate it. Eighteen miners are in jail on a charge of making moonshine. The miners are alleged to have walled up a section of an abandoned mine with fallen slate and equipped it to manufacture liquor on a large scale. They left a hole for an exit in case of a raid. When half a dozen officers crawled into the mine and, unnoticed, removed enough of the slate wall to admit them, they say they found three stills in operation. The first of the miners to reach the exit hole was so fat that he stuck in the hole long enough for the officers to capture him and those behind.

The Blanchard Coal Co., of Zanesville, **has started to place equipment** at Ellis on the Muskingum River, near Zanesville, where it will develop the 2,500 acres of coal land it recently purchased in that vicinity. This is to be one of the largest stripping propositions in the country, officials of the company have announced.

Tedrow Bros., coal operators of Crooksville, have obtained a lease on a tract of approximately 300 acres of coal land near McLuney which will be developed at once. It is planned to open a mine with an output of at least 500 tons from the start. Electrical machinery will be installed.

OKLAHOMA

The interest of the City of Sapulpa in the Sapulpa Fuel Co. has been sold by the commissioners of that city to the Bartlett Fuel Co. of Sapulpa, for $85,000.

PENNSYLVANIA

The first twenty of 1,000 steel coal cars of the latest type for the Pennsylvania Coal & Coke Corporation **have been delivered** and thirty more are almost ready for delivery. The company will spend approximately $2,000,000 on new equipment. The company also will erect repair shops in the district, but the location has not been definitely decided upon. The corporation owns 8,031 vein acres of coal land in central Pennsylvania and has under lease approximately 36,343 vein acres, with a coal reserve sufficient to keep the company operating to capacity for sixty years or more.

Under the provisions of a bill introduced in the Legislature at Harrisburg by Representative Walter W. Kohler, Lackawanna County, it will be unlawful to convey any illuminating gas through pipes or conduits extending through or over ground under which mining operations have heretofore or are now being prosecuted.

The Denver Rock Drill Manufacturing Co., of Denver, Colo., has opened additional branch offices in Pittsburgh and Pottsville, as well as in St. Louis, Mo. The company also announces that Andrews & George Co., Tokio, is its sole agent in Japan.

A movement has been launched among mining men of the Clearfield district looking to the **establishment of a mining institute** for the purpose of having all the mining men embraced within the territory bounded by Grampian, Snow Shoe, Janesville and McCartney meet at least once annually to discuss the problems encountered in mining, and disseminating information.

Members of the United Mine Workers held a mass meeting in Houtzdale on Sunday, March 18, to consider the situation and attempt to enlist the co-operation of the striking miners of the Berwind-White Coal Mining Co. at Windber for their fellow craftsmen at the company's mines in the Houtzdale region. James Gibson, of the Windber local, spoke, and President John Brophy of District No. 2 and others urged the union men to attempt to influence the Berwind-White miners at Houtzdale to join the union.

Representative Richard D. Burns, Philadelphia, sponsor of a resolution calling upon the Governor to create a permanent Fuel Commission, on March 5 **introduced a bill in the State Legislature amending the Public Service Company Act** of 1913, to provide that in addition to the public utilities now coming under the jurisdiction of the Public Service Commission shall be added coal corporations, coal-producing corporations, coal-selling and coal-distributing corporations. The Burns bill provides that the coal corporations be "declared to be public service or utilities companies within the laws of this Commonwealth." A joint resolution was introduced at the same session of the House by David Fowler, of Lackawanna county, **creating a legislative committee to investigate the coal-supply situation**, defining its powers and duties and making an appropriation of $5,000.

One hundred members attended the March meeting of the Pennsylvania Miners' Institute in Johnstown last week and heard a lengthy discussion on the reliability, safety and illumination of electric cap lamps. Twenty-five new members were admitted. Joseph J. Walsh, the state's chief mining inspector, and Rush N. Hosler, chief of the Pennsylvania coal-mine rating bureau, will be present and address the April meeting.

A meeting of the representatives of 40,000 miners in District No. 2, United Mine Workers of America, has been called for April 18 at Dubois. As the scale and other matters have been adjusted for the year, matters of importance only to the organization will come before the convention, although it was not given out in the call just what would be considered.

Two miners, Ora Clevenger of Houstontown and Samuel Gibson of Ralphton, **were instantly killed in an explosion** on March 17 in No. 4 mine of the Quemahoning Coal Co., at Ralphton. The cause of the explosion has not been determined. There were no other men at work in the vicinity at the time.

A new method of solving the mine-cave problem in the anthracite district is provided for in a bill introduced in the House by Representative Walter W. Kohler, Lackawanna County. The measure authorizes the county commissioners to levy a special tax on coal lands each year after first having made an estimate of the moneys necessary to provide 100 per cent reparation in cases of damage by surface subsidence due to mine caves. A special fund for this tax is created and it would be handled by the county commissioners, the county treasurer and the county controller. The provisions of the bill state that within two years after the measure becomes a law the commissioners are to make an estimate of the total amount of money needed to met a situation that may develop with the exhaustion of the coal supply. Following this the special tax would be levied on all coal in place. This would be made annually and be in addition to the county tax on coal lands.

The House of Representatives at Harrisburg on March 19 **passed the Folwer bill repealing the antharcite coal tax** of 1921 by a vote of 147 to 52. Representative David Fowler, Lackawanna, sponsor of the bill, said it had been amended so that it would not apply until Jan. 1, 1925, and that by that time the Commonwealth would have some financial plan that would not need a tax from hard-coal consumers.

The Burns bill, which gives the Public Service Commission jurisdiction over coal companies, making them public utilities, **was recommitted by the House on** March 19 for a hearing. This will be held March 28.

Representative John E. Stavitski, Luzerne County, **offered a series of three bills** March 20 relative to anthracite mining and miners. One of these measures is for the protection of anthracite coal miners in the **determination of the amount of coal to be used as a basis for calculating compensation** for miners and authorizing the miners to employ a check weighman. **A miners' reserve fund is created by another of the measures.** This bill provides that all coal that has been mined and which is not included in the weights allowed or credited to the miners shall be collected and weighed separately. The amount for which the operators would be liable for the mining of this coal, computed at the current rate of compensation, is to be paid into the fund which is to be used for the benefit of the employees injured in the mines or suffering from disease contracted in the mines or affected by old age. The third bill amends an act of 1891 and its supplements by repealing a provision that relates to certain exceptions in which operators of collieries need not keep at the mine a motor ambulance.

The Mattes mine-cave bills, introduced in the House at Harrisburg March 14 by David Fowler, Lackawanna, were referred March 19 by Speaker Goodnough to the House Committee on Ways and Means. Companion bills introduced in the Senate by Senator Davis, Lackawanna, were sent to the Mines and Mining Committee of which Senator Davis is chairman.

J. R. Robinson, ventilating engineer, 627 Wabash Building, Pittsburgh, on April 1 will sever his connection with the Robinson Ventilating Co., and will give his entire attention to the ventilation of mines. He will open an office at 627 Wabash Building, Pittsburgh.

T. D. Williams, of Johnstown, mine inspector for the Sixth Bituminous district, reports **3,874,786 tons of coal mined** in that district during 1922. Of this tonnage Cambria County mines produced 3,304,786 tons and Somerset County mines produced 570,154 tons.

UTAH

All efforts to abolish or restrict the powers or activities of the Public Utilities Commission—and they were many during the two months' session of the late Legislature—failed. At the close of the session President Thomas E. McKay, a Huntsville resident, who has presided over the Senate twice now, was appointed a member of the commission.

WEST VIRGINIA

Charles K. Francis and Harry M. Mohler, investigators representing the U. S. Coal Commission, **were in northern West Virginia inspecting mines about the middle of March.** Such an inspection is being made with a view to submitting a report on the efficiency of mining methods in northern West Virginia. The inspection is being made solely with reference to the physical aspects of mining and the investigators are not concerning themselves with the financial end of the industry at this time. Among other mines visited was one of the Hudson Coal Co. in Harrison County which is operated on a non-union basis. Mines of the Hutchinson Coal Co. also were visited by the federal investigators.

A bill introduced in the West Virginia House of Delegates by Representative Estep of Logan County and in the Senate by Senator McClaren of McDowell County, upon request **would make voluntary associations suable.** It simply provides that any voluntary association of seven or more members may sue and be sued in the name of the association and that service of process upon any officer, manager or business agent of such association shall constitute service upon the association.

The proposal to create a school of mines in West Virginia is incorporated in Senate Bill No. 348, introduced by Senator A. L. Helmick of Tucker County, who is engaged in the mining business. The bill prescribes that the West Virginia School of Mines shall contain departments of mining engineering, mining extension, mining geology and chemical engineering as well as the mining experiment station already authorized under existing law. The departments of mining and chemical engineering and mining extension at present a part of the College of Engineering in the West Virginia University would be transferred to the West Virginia School of Mines. It also is prescribed that the West Virginia School of Mines shall be organized as a part of the West Virginia University.

Capitalized at $75,000, the **Preston Smokeless Coal Co.** of Fairmont has been organized for the purpose of operating in the Preston County field. Active in organizing this company were J. S. Mallory, Gertrude W. Mallory, of Shinnston; H. S. Keister, Toyle A. Keister and M. B. Simmons, all of Fairmont.

The White Rose Coal Co. is the name of a new company with headquarters at Shinnston, organized for the purpose of operating in the Harrison County field. It has a capital of $75,000. Incorporators of the new concern were Urvin Smith, H. J. Wagner, George Beck and William Beck, all of Smithton, Pa.; John Parachino, of Greensburg, Pa.

George S. Connell of Charleston, has been appointed by President J. A. Clark, Jr., of the Northern West Virginia Coal Operators' Association as a member of the scale committee for the ensuing year. This committee negotiates wage scales for the Fairmont region with the United Mine Workers.

WYOMING

Frank Turner, of Rexburg, Idaho, is authority for the report that the **Blazon Coal Co.** is negotiating for the Star mine at Glencoe, near Kemmerer. L. F. Rains, president of the Blazon Coal Co., also operates the Carbon Fuel Co. and is identified with the newly organized Columbia Steel Corporation, both of Utah.

WASHINGTON, D. C.

Postmaster Merritt O. Chance has resigned as head of the Washington city post office to become first vice-president and secretary of the newly incorporated **Griffith Coal Corporation** of Washington. W. W. Griffith, incorporator of the new concern, is one of the oldest and largest coal dealers of the city.

Plans are being perfected whereby **coal-mining companies may obtain a lower rate on their group insurance** based on the percentage of their men who have been trained in first-aid and safety work by the Bureau of Mines. A further reduction is being arranged at those points where there is an active chapter of the Joseph A. Holmes Safety Association.

The U. S. Supreme Court on March 19 affirmed the decision of the Court of Claims **sustaining a demurrer entered by the government to the petition of the J. M. MacDonald Coal Mining Co.** for the difference between the price it received for coal under the Lever act and the price it claimed would have yielded it cost of production plus a just and reasonable profit. The government had demurred to the claim on the ground that the MacDonald company had no just claim as it had not complied fully with the regulations under the Lever act. The decision follows precedents in other cases arising out of this act.

CANADA

At a conference at Calgary, Alberta, on March 14, the Western Canada Coal Operators' Association and the miners of District 18, United Mine Workers of America, **renewed for another year their wage-rate agreement,** which terminates on March 31.

The charge before Judge Taylor, in the Criminal Court, at Edmonton, Alta., against W. M. Ryan, of the United Mine Workers of America, and 137 men for unlawful assembly having been dismissed, **the strike in the northern Alberta coal field has petered out,** though a little desultory picketing is still maintained. All the mines are being operated and the output is as great as it was before the strike was attempted.

The Illinois-Alberta well, in the Okotoks field, 35 miles south of Calgary, where a heavy flow of wet gas was struck recently, **caught fire on March 14,** and the derrick and equipment were completely destroyed, causing a loss estimated at $25,000. The fire was extinguished on March 16. The well was capable of producing about 40 barrels of gasoline and 3,000,000 cu.ft. of gas daily.

Sympathy toward the unionization idea but **distinct disapproval of any connection with the United Mine Workers of America** appears to be the attitude of miners in the Clover Bar and Edmonton fields. A new union has been formed, affiliated with the Canadian Federation of Labor, but not with the United Mine Workers.

The Dominion Government is to be asked to probe the whole question of coal mine operating costs and sales prices by the Associated Boards of Trade of Eastern British Columbia, which recently adopted this resolution "that this convention is of the opinion that price adjustments in the coal industry are long overdue and that in the interests of that industry itself, dependent industries, and the general public, such adjustments should be made forthwith, and that the Dominion Government should probe the whole situation."

The coal operators of the Province of Alberta are protesting against a proposed increase of compensation rate under the Alberta workmen's compensation act of from 55 to 66⅔ per cent, but there is no indication that Premier Greenfield's government is prepared to make any concessions. Representatives of the collieries admit that the change would appear to bring Alberta's rate on the same plane as that of other provinces, but they assert that comparisons are not fair because of the high wages paid in that province. In Ontario 66⅔ per cent is the basis, but there metalliferous miners receive $4.50 a day while in Alberta mines the wages are $7.50 a day and upward.

Association Activities

Pittsburgh Section of A.I.M.E.

On March 15 a dinner was held by the Pittsburgh section of the American Institute of Mining and Metallurgical Engineers, at which Chairman Crabtree introduced Edward Payson Mathewson, the new president. In his talk to the gathering Mr. Mathewson spoke of the aims of the institute and what each member should bear in mind to aid in its expansion, emphasizing the necessity of interesting young engineers in the work of the organization. He condemned state legislation which, if enacted, would require every engineer to be licensed. Instead of elevating the position of the engineer in public view, he said, such legislation would lower it by causing the masses to believe that every licensed engineer is a capable engineer, else he would not be licensed; that experience and name rather than a certificate of qualification should give rank to the engineer. Graham Bright was elected chairman of the Pittsburgh section for the coming year and the members voted that Mr. Goodale continue in the office of secretary.

International Railway Fuel Association

Periodical meetings in the principal railroad centers to stimulate interest in fuel matters is one of the activities recently undertaken by the International Railway Fuel Association. In December, 1922, President J. N. Clark, acting upon authority of the executive committee, requested members in some of the larger railroad centers to organize district chapters. This work is now being carried forward and the District of Columbia Chapter, which was organized on Jan. 10, 1923, has already held two meetings. The subjects discussed by this chapter included "Forms of Fuel Contracts," "Practicability of Fuel Purchased on Specification Basis," "Methods of Fuel Distribution by Direct Consignment from Mines to Coaling Station and Otherwise," and "Supervision of Locomotive Operation." The Chicago District Chapter held a meeting on March 12, at which W. E. Dunham, assistant superintendent of motive power and machinery of the Chicago & North Western R.R., presented a paper on "Cold Weather Practices as Related to Fuel Conservation." Each section will be allowed to work out its own program for the discussion of problems of local or general interest. It is thought that by holding informal meetings each thirty or sixty days the members will be able to carry out the objects of the organization to better advantage and to promote the best methods for fuel economy in their own territory.

Indiana Bituminous Coal Operators' Association

The Indiana Bituminous Coal Operators' Association, in annual meeting March 14, at the office of Phil H. Penna, secretary, elected the following officers for the year: E. D. Logsdon, president; Paul Zimmerman, vice-president, and P. H. Penna, secretary and treasurer. Executive board members elected were: H. M. Ferguson, Clinton, Ind.; M. L. Gould, Indianapolis; C. Zellar, Brazil; David Engle and James Moore, Evansville; John Connery and G. James Pauley, Chicago, Ill.; J. A. Templeton, Paul Zimmerman, A. M. Ogle, George C. Richards, J. C. Kolsem, Homer Talley, W. D. Freeman, Hugh Shirkie and Robert B. Smith, of Terre Haute.

Traffic News

The Baltimore & Ohio R.R. has just closed contracts for 75 additional locomotives, which it is expected will be delivered next autumn. They will cost approximately $75,000 each. Order for 25 of them was placed with the Lima Locomotive Works at Lima, Ohio, and 50 with the Baldwin Locomotive Works at Eddystone, Del. The plants of both of these companies are located on the lines of the B. & O.

A brief filed with the Interstate Commerce Commission by the Southwestern Interstate Coal Operators' Association and the Oklahoma Coal Operators' Association urges **the commission to prescribe reasonable and just rates on coal** from mines in Missouri, Kansas, Arkansas and Oklahoma to various destinations in Kansas, Missouri, Nebraska and Iowa, particularly to the cities and towns located on or in the vicinity of the Missouri River. The brief states that the Southwestern association is composed of 170 members and the Oklahoma association of 47 members.

The city of Zion City, Ill., has lost its appeal to the I. C. C. suit for cheaper coal rates from the mines. Rates on coal to Zion City have been found to be reasonable in the case filed by Zion City industries against the Evansville, Suburban & Newburgh R.R., Evansville, Ind.

The Coal, Coke & Iron Ore Committee, Central Freight Association territory, will hold a hearing April 12 in the Chamber of Commerce Building, Pittsburgh, Pa., **to consider the proposed establishment of a rate of $1.01 per gross ton on bituminous coal,** carloads, to 26th Street, 33rd Street, Pittsburgh (Duquesne) and Grant Street deliveries, Pittsburgh, Pa., from junctions with the Union R.R. (Pittsburgh, Pa.).

The **Coal, Coke and Iron Ore Committee, Central Freight Association territory,** will hold a hearing, April 12 in the Chamber of Commerce Building, Pittsburgh, Pa., **to consider the proposed establishment of a rate of $1.13 per net ton on bituminous coal,** carloads, to stations on the Baltimore & Ohio R.R. between Pine Grove, W. Va., and Bane, W. Va., inclusive, from origin points between Clauson, W. Va., and Hepzibah, W. Va., and from Limestone, W. Va., including mines and other points intermediate.

The matter of rates on slack from Arkansas and Oklahoma mines to Texas points will be the subject of oral argument before Division 2 of the Interstate Commerce Commission in Washington on April 26.

An embargo was placed March 14 by the Lehigh Valley R.R. against all shipments of bituminous coal for J. Skolik & Sons, Newark, N. J.

The Delaware, Lackawanna & Western R.R. has cancelled an embargo against all freight destined to all points via Delaware & Hudson Company, Binghamton, N. Y.

Embargo placed by the Delaware & Hudson Co., against traffic from Pennsylvania R.R., Lehigh Valley R.R., Central Railroad of New Jersey at Wilkes-Barre and Hudson, Pa., and from Delaware, Lackawanna & Western and Erie railroads at Binghamton, N. Y., and Lehigh Valley R.R. at Owego, N. Y., destined to points on or via the D. & H. Co., **is modified** by cancelling. Paragraph B of Sect. 2 which will now permit acceptance of all carload and less carload freight from D., L. & W. or Erie R.R. at Binghamton, N. Y., and from Lehigh Valley R.R., at Owego, N. Y., when destined to any D. & H. Co. station.

Embargo placed by the Boston & Albany R.R. against all carload freight from connecting lines at Albany, West Albany Transfer and Rensselear, N. Y., destined to points on or via the New York, New Haven & Hartford R.R. when routing via Springfield, Mass., **is entirely cancelled.**

On account of accumulation the Long Island R.R. on March 20 **embargoed all carload freight** for team track delivery at Elmhurst, N. Y., also all freight consigned to or intended for the Elmhurst Coal Co., Elmhurst, N. Y.; exceptions: livestock, perishable foodstuffs, for human consumption, field and garden seed, fertilizer and U. S Government freight.

On account of accumulation the Long Island R.R. on March 20 **embargoed all carload freight** requiring crane delivery at Flatbush Avenue Station, Brooklyn, N. Y.

On account of accumulation **an embargo** was placed March 20 by the Pennsylvania R.R. system **on all shipments of bituminous coal** consigned, reconsigned or intended for **delivery to the American Lime & Stone Co.,** Bellefonte, Pa. Shipments originate principally in the Pittsburgh and Clearfield districts.

Obituary

Charles Stewart Ramsay, for many years superintendent of the Dora division of the Pratt Consolidated Coal Co., Birmingham, Ala., but recently removed to Sanford, N. C., where he assumed the management of the Erskine Ramsay Coal Co., died in Birmingham, March 17, after an operation for appendicitis. Mr. Ramsay was 43 years of age and went to the Birmingham district about twenty years ago from Shafton, Pa., having been connected with the Pratt company since then, and was widely known and considered an able mining man. He was a brother of Erskine Ramsay, vice-president and chief engineer of the Pratt company, an engineer and inventor of national repute. He is also survived by his widow, five children and five brothers and three sisters. The body was sent to Shafton, Pa., for interment.

Calvin Pardee, who with his father, Ario Pardee, and brother, Ario, Jr., had a prominent part in the development of the anthracite industry of Pennsylvania, died March 18 at his home in Philadelphia. He was 81 years old and until a few months ago had been in active charge of his varied business interests. Mr. Pardee was a former president of the Lehigh Coal & Navigation Co., a director of the Lehigh Valley Railroad Co., the North Penn Railroad Co., the Tennessee & West North Carolina Railway Co., and of the Cranberry Iron, Coal & Furnace Co., of Tennessee.

John J. Brown, 71 years old, president of the Pittston Coal Co., for the last fifteen years, died March 20 at his home in Scranton, Pa. He was ill of complication for one month. Born in Carbondale on June 24, 1852, Mr. Brown lived in that city until he was twenty-three years old, working in a blacksmith shop. He later moved to Scranton, where he entered the employ of the Adams Express Company. He eventually became connected with the Garney & Short Cigar Company as a salesman, finally being made a member of the firm. For the last fifteen years he was head of the Pittston Coal Co. His wife, three sisters and a brother survive him.

Coming Meetings

National Retail Coal Merchants' Association will hold its sixth annual convention June 25, 26 and 27 at Scranton, Pa., with headquarters at the Hotel Casey. The registration fee of $15 will include all meals except breakfast, transportation to and from the mines which will be visited, and the banquets. The only other expenses to be incurred will be hotel room and transportation to and from Scranton. Executive secretary, J. E. O'Toole, Philadelphia, Pa.

National Safety Council will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

International First-Aid and Mine-Rescue meet will be held Aug. 27-29, at Salt Lake City, Utah.

American Institute of Electrical Engineers will hold its annual convention June 25-29, at Swampscott, Mass. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.

The Virginia Coal Operators' Association will hold its annual meeting on April 21 at Norton, Va. Secretary, G. D. Kilgore, Norton, Va.

International Railway Fuel Association will hold its spring convention at the Hotel Winton, Cleveland, Ohio, May 21-24. Secretary-treasurer, J. G. Crawford, Chicago, Ill.

The American Mining Congress will hold its twenty-sixth annual convention in conjunction with the **National Exposition of Mines and Mining Equipment,** Sept. 24-29, at the Milwaukee Auditorium, Milwaukee, Wis. Secretary, J. F. Callbreath, Washington, D. C.

Indiana Retail Coal Merchants' Association will hold its annual meeting April 25 and 26 at the Severin Hotel, Indianapolis, Ind. Secretary, R. R. Yeagley, Indianapolis, Ind.

American Society for Testing Materials will hold its annual meeting at the Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., beginning June 25 and continuing throughout the week. Secretary, E. Marburg, Philadelphia, Pa.

The Colorado & New Mexico Coal Operators' Association will hold its annual meeting June 20 at Denver, Col. Secretary, F. O. Sandstrom, Denver, Col.

The Electric Power Club's annual meeting will be held at the Homestead, Hot Springs, Va., June 11-14. Executive secretary, S. N. Clarkson, Cleveland, Ohio.

National Foreign Trade Council will hold its annual conference May 2-4 at New Orleans, La. Secretary, O. K. Davis, 1 Hanover Square, New York City.

The Gas and Fuel Section of the American Chemical Society is arranging a second sectional meeting at the New Haven meeting of the American Chemical Society during the first week in April.

The eleventh annual meeting of the Chamber of Commerce of the United States will be held in New York City May 7-10.

National Coal Association will hold its sixth annual convention June 19-22 at Atlantic City, N. J. Assistant secretary, C. C. Crowe, Washington, D. C.